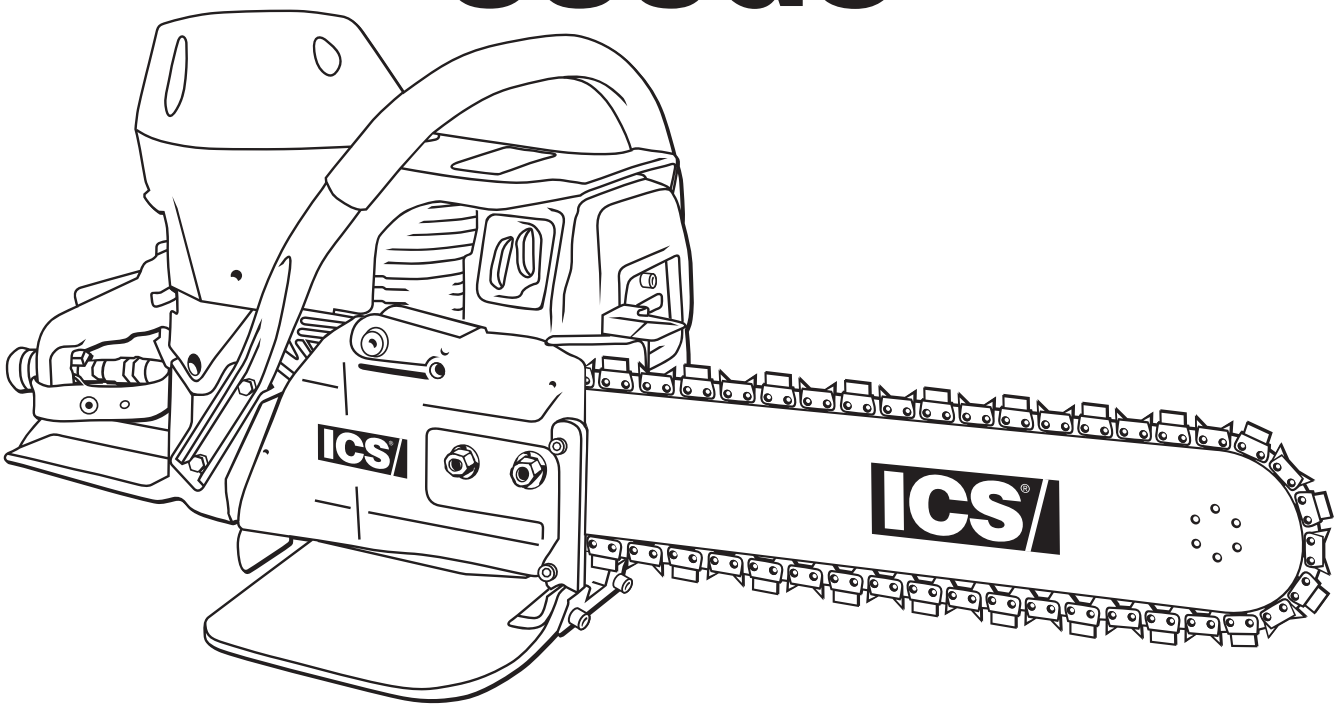
# 680GC




# SERVICE MANUAL



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# Service Manual Use

This manual contains all the technical information necessary for carrying out repairs on the 680GC saw. For safe, efficient work, it is of prime importance that the values indicated be adhered to. Routine periodic maintenance is covered in the operator's manual included with each saw.

## General Shop Rules

- Always use the right tools for the job, otherwise components may be damaged.
- Use a plastic dead blow mallet to separate parts attached solidly to each other.
- Mark mating parts as a reassembly reference.
- Keep component parts together as a group. Assemble screws and nuts into appropriate subgroups.
- When reassembling, clean all parts carefully, lubricate moving parts and replace all oil seals, o-rings, gaskets, washers and self-locking nuts.
- **For best results, use only original ICS® replacement parts.**

## General Recommendations

- Some procedures in this manual require the use of special tools. A complete tool kit for the 680GC is available from ICS®.
- Detailed carburetor maintenance and overhaul information is available in Walbro's Diaphragm Carburetor Service Manual. Walbro can be contacted at http:\\www.walbro.com or by calling 1.989.872.2131.


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# 680GC Service Tool Kit - P/N 71700

| Key # | Part No. | Description |
|---|---|---|
| Above | 71700 | Gas Saw Service Tool Kit, includes all items shown above |
| 1 | 71521 | Scrench 13-19 mm |
| 2 | 71541 | Pressure Gauge Bulb |
| 3 | 71542 | Coil/Flywheel Timing Shim |
| 4 | 71543 | Cylinder Assembly Clamps & Piston Stop |
| 5 | 71544 | Manifold Assembly Tool |
| 6 | 71546 | Shock Absorber Tool |
| 7 | 71547 | Spark Tester |
| 8 | 71548 | Flywheel Disassembly Tool |
| 9 | 71550 | Limiter Cap Puller |
| 10 | 71565 | Electronic Tachometer |
| 11 | 71569 | Induction Seal Flange with Screws |
| 12 | 71570 | Exhaust Seal Flange with Screws |
| 13 | 71573 | Tuning Screwdriver |
| 14 | 73463 | Main Bearing Spacing Tool |
| 15 | 73425 | Fuel Tank Pressure Cap |
| 16 | 73462 | Main Bearing Driver Tool |
| Items below are not included in P/N 71700, Gas Saw Service Tool Kit, but can be purchased separately | | |
| Not Shown | 71734 | Gasket Set |
| Not Shown | 70249 | 14T Bar Nose Sprocket Repair Kit |
| Not Shown | 71625 | Carburetor Tuning Kit |
| Not Shown | 505882 | 2-Stroke Oil, 25:1 Mix, 5.2 oz (158 ml) (6-Pack) |
| Not Shown | 505883 | 2-Stroke Oil, 25:1 Mix, 5.2 oz (158 ml) (24-Pack) |

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# Specifications

| | |
|---|---|
| Engine Type | 2-stroke Single Cylinder Air Cooled |
| Displacement | 4.7 cu-in (76.5 cc) |
| Horsepower | 5 hp (3.7 kW) @ 9,500 rpm |
| Torque | 36.3 in-lbs (4.1 Nm) @ 6,500 rpm |
| Engine Speed | 11,500 +/- 500 rpm (max)<br>2,800-3,200 rpm (idle) |
| Weight | 21 lbs (9.5 kg) without guidebar and diamond chain |
| Dimensions | 18 inches (46cm) length<br>11.5 inches (29cm) height<br>10 inches (25cm) width |
| Air Filter | Water resistant polyester |
| Carburetor | Walbro WJ122B |
| Starter | Dust and water resistant |
| Ignition | Special water resistant electronic ignition |
| Clutch | Centrifugal, three shoe, single spring |
| Fuel ratio | 25:1 (4%) gasoline-to-oil |
| Fuel Capacity | 0.23 gal (.88 liter) |
| Water Supply | Minimum 20 psi (1.5 bar) |
| Water Flow | Minimum: 2 gpm (8 lpm) |
| Noise Level | 101 dB at 3 ft (1m) |
| Vibration Level | 7.2 $m/s^2$ (front handle)<br>8.5 $m/s^2$ (rear handle) |
| Engine Break-in Period | One tank, without cutting, cycling throttle |
| Spark Plug | NGK BPMR8Y<br>Electrode gap .020 in (0.5 mm) |


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**3** This section shows the two locations of the serial number.

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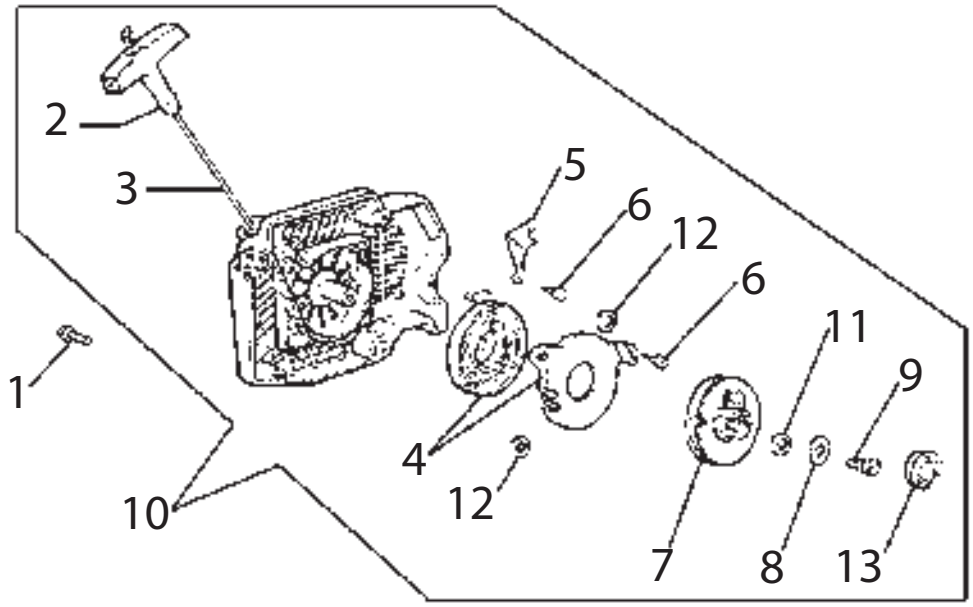
**4** This section covers torque, Loctite®, and lubrication requirements of the individual components.

## STARTER ASSEMBLY




**For saws with serial number starting 967 & 977.**

| KEY | DESCRIPTION | TORQUE | | LOCTITE® | PART NUMBER |
|---|---|---|---|---|---|
| | | Nm | in-lbs. | 242 | |
| 1 | SCREW | 4.0 | 35 | X | 73230 |
| 2 | STARTER ROPE HANDLE | | | | 530208 |
| 3 | STARTER ROPE | | | | 73904 |
| 4 | STARTER COIL SPRING & HOUSING | | | | 531103 |
| 5 | STARTER CASE PLATE | | | | 71451 |
| 6 | SCREW | | | | 505380 |
| 7 | STARTER ROPE PULLEY | | | | 528661 |
| 8 | STARTER PULLEY WASHER | | | | 73905 |
| 9 | STARTER PULLEY SCREW | 5.9 | 52 | X | 73907 |
| 10 | STARTER COVER ASSEMBLY | | | | 528637 |
| 11 | STARTER ASSEMBLY WASHER | | | | 530367 |
| 12 | SPRING HOUSING WASHER | | | | 532026 |
| 13 | STARTER ASSEMBLY CAP | | | | 508853 |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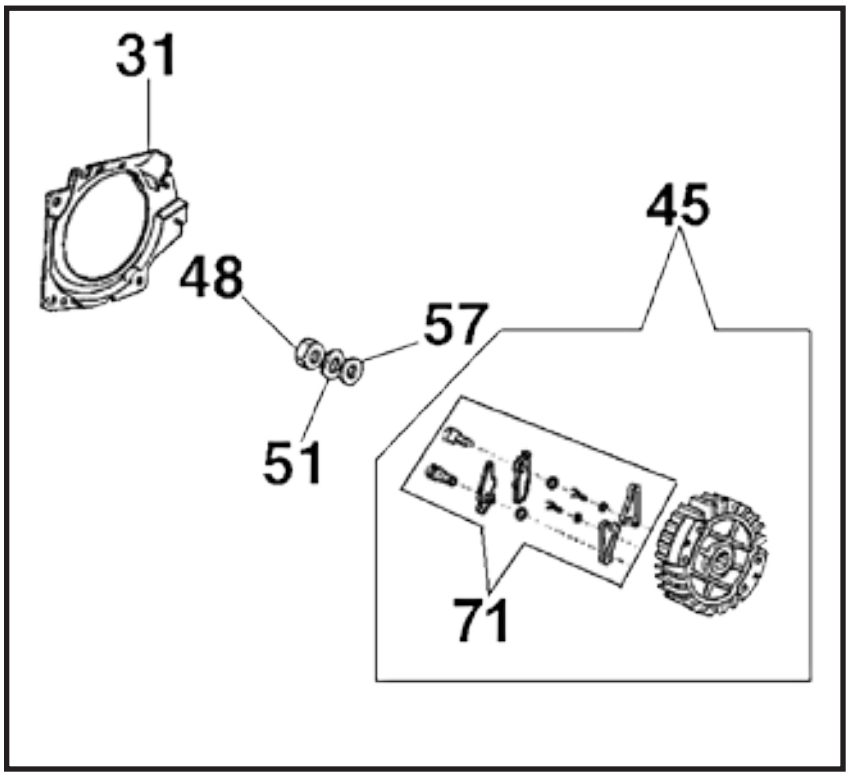
## FLYWHEEL & STARTER PAWL ASSEMBLY




**For saws with serial numbers starting 967.**

**(see page 8 for serial number starting 977)**

| KEY | DESCRIPTION | TORQUE | | LOCTITE® 242 | PART NUMBER |
|---|---|---|---|---|---|
| | | Nm | in-lbs. | | |
| 31 | FLYWHEEL SHROUD | | | | 531109 |
| 45 | FLYWHEEL ASSEMBLY | 6.9 | 61 | | 528651 |
| 48 | NUT | 29.3 | 260 | | 73891 |
| 51 | WASHER | | | | 73911 |
| 57 | WASHER | | | | 73912 |
| 71 | STARTER PAWL ASSEMBLY | | | | 509163 |

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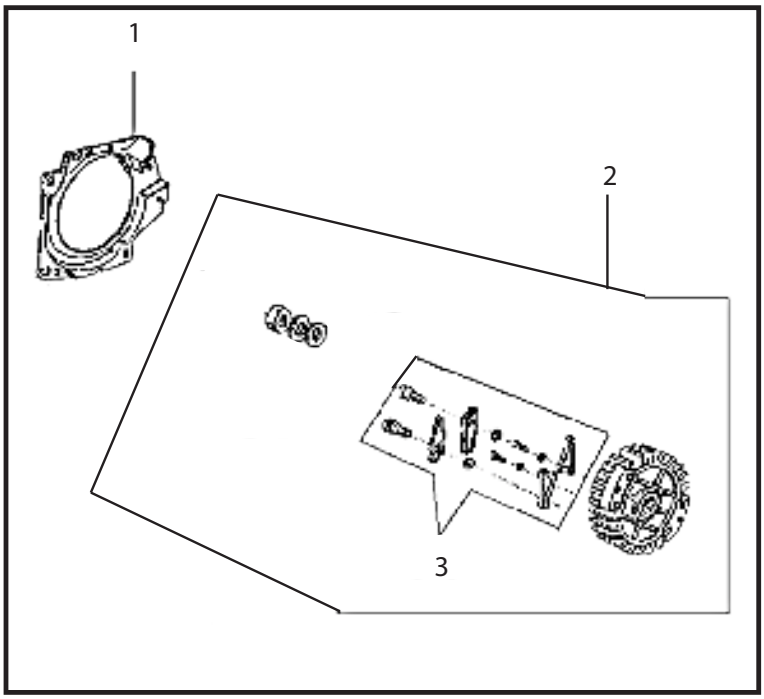
## FLYWHEEL & STARTER PAWL ASSEMBLY




**For saws with serial numbers starting 977.**
**(see page 7 for serial number starting 967)**

| KEY | DESCRIPTION | TORQUE | | LOCTITE® 242 | PART NUMBER |
|---|---|---|---|---|---|
| | | Nm | in-lbs. | | |
| 1 | FLYWHEEL SHROUD | | | | 531109 |
| 2 | FLYWHEEL ASSEMBLY KIT | 29.3 | 260 | | 545963 |
| 3 | STARTER PAWL ASSEMBLY | | | | 509163 |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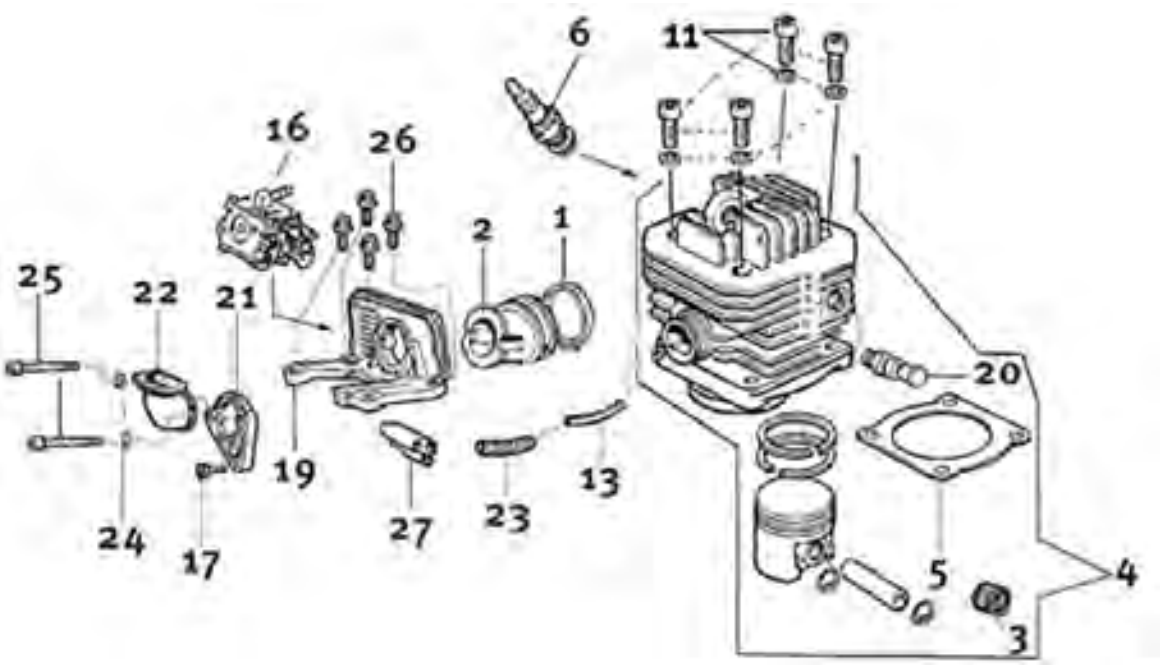
## CYLINDER AND INTAKE ASSEMBLY

# For saws with serial numbers starting 967.

**(see page 10 for serial number starting 977)**




| KEY | DESCRIPTION | TORQUE | | LOCTITE® 242 | PART NUMBER |
|---|---|---|---|---|---|
| | | Nm | in-lbs. | | |
| 1 | INTAKE MANIFOLD CLAMP | | | | 73867 |
| 2 | INTAKE MANIFOLD | | | | 73868 |
| 3 | WRIST PIN NEEDLE BEARING | | | | 73869 |
| 4 | COMPLETE PISTON/CYLINDER ASSEMBLY | | | | 71413 |
| 5 | CYLINDER BASE GASKET ASSEMBLY | | | | 71412 |
| 6 | SPARK PLUG | 27.5 | 243 | | 514770 |
| 11 | CYLINDER BOLT | 10.7 | 95 | X | 73874 |
| 13 | CARBURETOR PULSE TUBE | | | | 73898 |
| 16 | CARBURETOR, WALBRO WJ-122B | | | | 528628 |
| 17 | INTAKE MANIFOLD FLANGE SCREW | 4.0 | 35 | X | 73901 |
| 19 | CARBURETOR SUPPORT BRACKET | | | | 73895 |
| 20 | DECOMPRESSION VALVE | 12.8 | 113 | | 71642 |
| 21 | INTAKE MANIFOLD FLANGE | | | | 73947 |
| 22 | INTAKE MANIFOLD | | | | 71735 |
| 23 | CARBURETOR SPRING | | | | 73888 |
| 24 | WASHER | | | | 73897 |
| 25 | SCREW & WASHER | | | | 505469 |
| 26 | SCREW | | | | 73866 |
| 27 | SCREW GUIDE | | | | 517547 |

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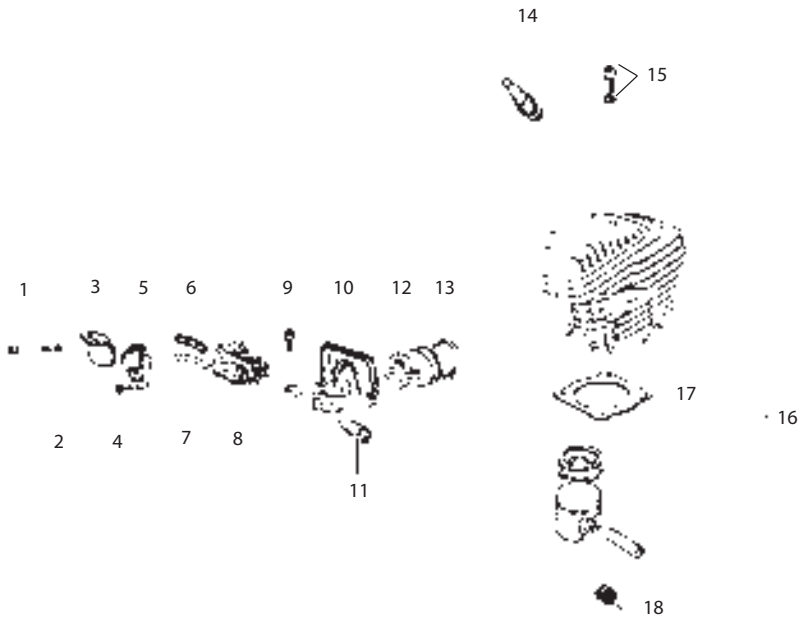
## CYLINDER AND INTAKE ASSEMBLY

# For saws with serial numbers starting 977.

**(see page 9 for serial number starting 967)**




| KEY | DESCRIPTION | TORQUE | | LOCTITE® 242 | PART NUMBER |
|---|---|---|---|---|---|
| | | Nm | in-lbs. | | |
| 1 | SCREW & WASHER | | | | 505469 |
| 2 | WASHER | | | | 73897 |
| 3 | INTAKE MANIFOLD | | | | 71735 |
| 4 | INTAKE MANIFOLD FLANGE SCREW | 4.0 | 35 | X | 73901 |
| 5 | INTAKE MANIFOLD FLANGE | | | | 73947 |
| 6 | CARBURETOR SPRING | | | | 73888 |
| 7 | CARBURETOR PULSE TUBE | | | | 545877 |
| 8 | CARBURETOR, WALBRO WJ-122B | | | | 528628 |
| 9 | SCREW | 4.0 | 35 | X | 73866 |
| 10 | CARBURETOR SUPPORT BRACKET | | | | 73895 |
| 11 | SCREW GUIDE | | | | 517547 |
| 12 | INTAKE MANIFOLD | | | | 73868 |
| 13 | INTAKE MANIFOLD CLAMP | | | | 73867 |
| 14 | SPARK PLUG | 27.8 | 243 | X | 514770 |
| 15 | CYLINDER BOLT | 10.7 | 95 | X | 73874 |
| 16 | COMPLETE PISTON/CYLINDER ASSEMBLY | | | | 548084 |
| 17 | GASKET, BASE | | | | 545874 |
| 18 | WRIST PIN NEEDLE BEARING | | | | 73869 |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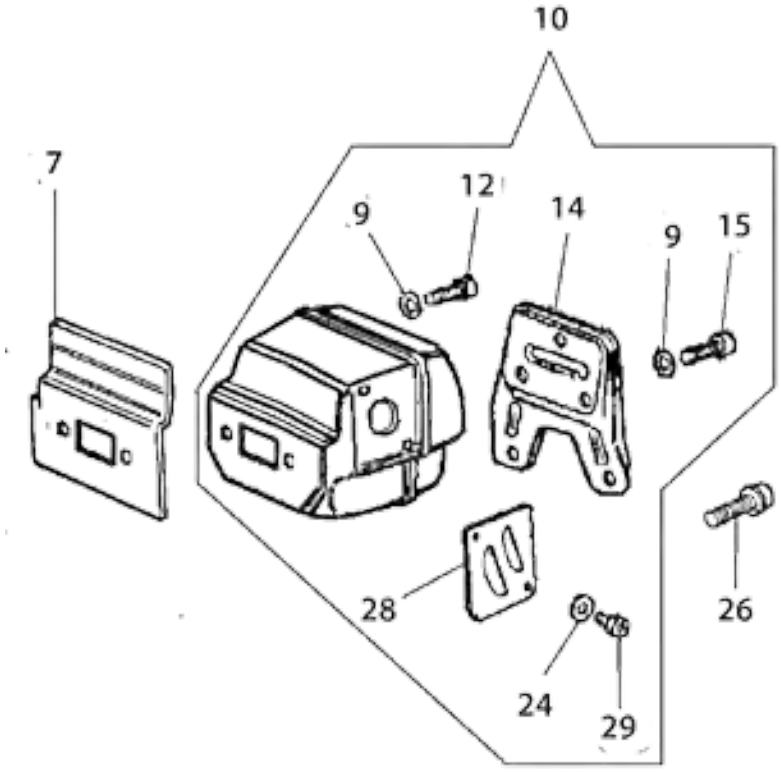
## MUFFLER ASSEMBLY

# For saws with serial numbers starting 967.

**(see page 12 for serial number starting 977)**




| KEY | DESCRIPTION | TORQUE | | LOCTITE® 242 | PART NUMBER |
|---|---|---|---|---|---|
| | | Nm | in-lbs. | | |
| 7 | CYLINDER TO MUFFLER GASKET | | | | 73881 |
| 9 | SERRATED WASHER | | | | 73327 |
| 10 | MUFFLER ASSEMBLY | | | | 71411 |
| 12 | MUFFLER MOUNTING SCREW | 9.8 | 87 | | 73883 |
| 14 | MUFFLER SUPPORT BRACKET | | | | 73884 |
| 15 | MUFFLER SUPPORT BRACKET SCREW | 8.8 | 78 | | 73885 |
| 24 | WASHER | | | | 73897 |
| 26 | SCREW | 4.0 | 35 | X | 73866 |
| 28 | MUFFLER DEFLECTOR | | | | 71481 |
| 29 | SCREW | 4.0 | 35 | X | 71482 |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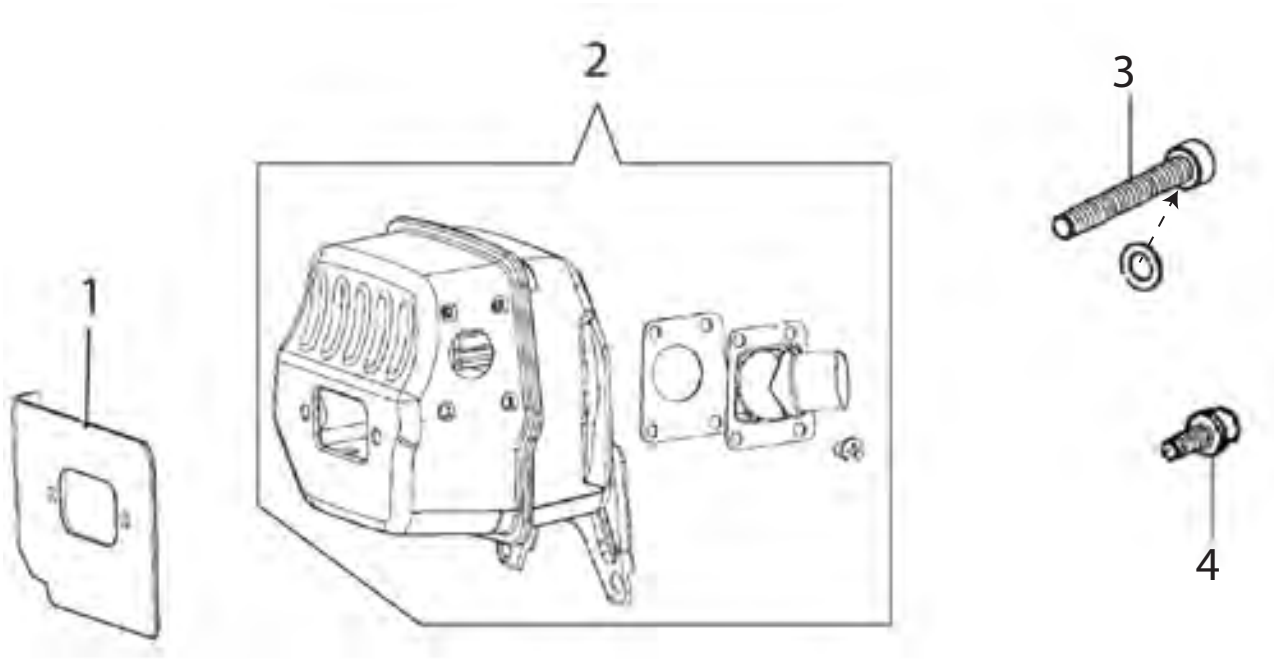
## MUFFLER ASSEMBLY

# For saws with serial numbers starting 977.

**(see page 11 for serial number starting 967)**




| KEY | DESCRIPTION | TORQUE | | LOCTITE® 242 | PART NUMBER |
|---|---|---|---|---|---|
| | | Nm | in-lbs. | | |
| 1 | CYLINDER TO MUFFLER GASKET | | | | 545875 |
| 2 | MUFFLER ASSEMBLY | | | | 545872 |
| 3 | SCREW & WASHER | 9.8 | 87 | | 505469 |
| 4 | SCREW | 4.0 | 35 | X | 73866 |

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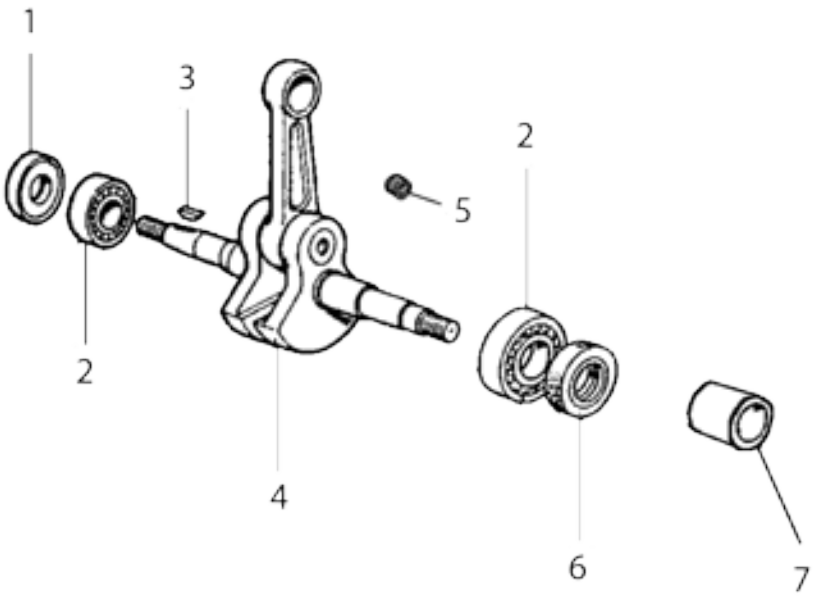
## CRANKSHAFT ASSEMBLY

# For saws with serial number starting 967 & 977




| KEY | DESCRIPTION | TORQUE | | LOCTITE® 242 | PART NUMBER |
|---|---|---|---|---|---|
| | | Nm | in-lbs. | | |
| 1 | CRANKSHAFT SEAL FLYWHEEL SIDE | | | | 73877 |
| 2 | CRANKSHAFT BEARING | | | | 73209 |
| 3 | CRANKSHAFT FLYWHEEL WOODRUFF KEY | | | | 73878 |
| 4 | CRANKSHAFT ASSEMBLY | | | | 71410 |
| 5 | WRIST PIN NEEDLE BEARING | | | | 73869 |
| 6 | CRANKSHAFT SEAL CLUTCH SIDE | | | | 73289 |
| 7 | CRANKSHAFT BUSHING | | | | 71452 |

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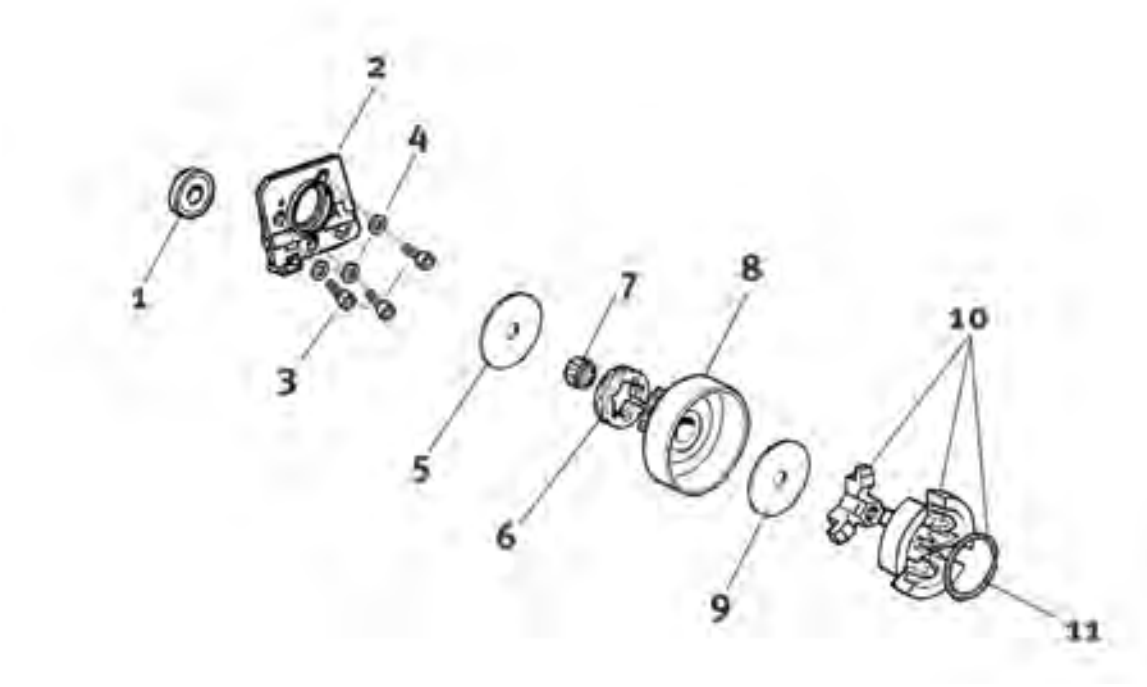
## CLUTCH ASSEMBLY

# For saws with serial number starting 967 & 977




| KEY | DESCRIPTION | TORQUE | | LOCTITE® 242 | PART NUMBER |
|---|---|---|---|---|---|
| | | Nm | in-lbs. | | |
| 1 | OUTER CRANKCASE SEAL, CLUTCH SIDE | | | | 73931 |
| 2 | OUTER CRANKCASE SEAL BODY | | | | 73949 |
| 3 | BOLT | 2.9 | 26 | | 73940 |
| 4 | WASHER | | | | 73285 |
| 5 | CLUTCH SPACER WASHER | | | | 73945 |
| 6 | 8T RIM SPROCKET KIT | | | | 70949 |
| 7 | CLUTCH NEEDLE BEARING | | | | 73939 |
| 8 | CLUTCH DRUM ASSEMBLY | | | | 71520 |
| 9 | CLUTCH SPACER WASHER, INSIDE | | | | 73941 |
| 10 | CLUTCH ASSEMBLY | 33.3 | 295 | | 71419 |
| 11 | CLUTCH SPRING | | | | 73943 |



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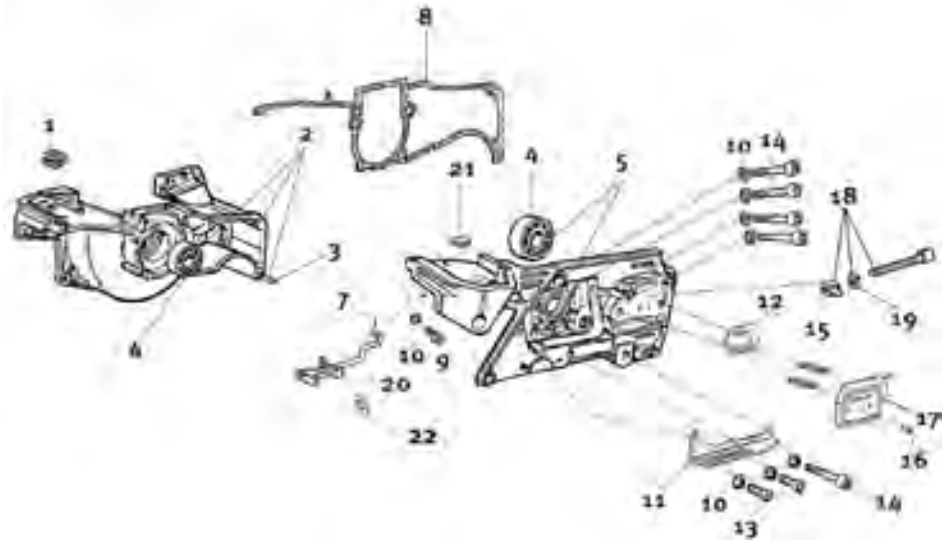
## CRANKCASE ASSEMBLY

# For saws with serial numbers starting 967.

**(see page 16 for serial number starting 977)**




| KEY | DESCRIPTION | TORQUE | | LOCTITE® 242 | PART NUMBER |
|---|---|---|---|---|---|
| | | Nm | in-lbs. | | |
| 1 | FUEL LINE GROMMET, CRANKCASE | | | | 73390 |
| 2 & 5 | CRANKCASE ASSEMBLY, RIGHT & LEFT | | | | 528653 |
| 3 | CRANKCASE DOWEL PIN | | | | 73281 |
| 4 | CRANKSHAFT BEARING | | | | 73209 |
| 7 | CHOKE LEVER SPLIT PIN | | | | 73927 |
| 8 | CRANKCASE GASKET | | | | 73934 |
| 9 | CRANKCASE BOLT | 7.8 | 69 | X | 73930 |
| 10 | WASHER | | | | 73897 |
| 11 | CHAIN GUARD | | | | 528657 |
| 12 | BAR MOUNT PAD SPACER | | | | 71740 |
| 13 | COVER GUARD MOUNTING BOLT | 7.8 | 69 | X | 73397 |
| 14 | SCREW | 4.9 | 43 | X | 73379 |
| 15 | BAR MOUNTING STUD | 11.8 | 104 | | 73933 |
| 16 | SCREW | 7.8 | 69 | | 73284 |
| 17 | BAR MOUNT PAD COVER PLATE | | | | 71738 |
| 18 | PREMIUM TENSIONER KIT | | | | 73935 |
| 19 | TENSIONER SCREW RETAINER | | | | 73936 |
| 20 | CHOKE LEVER | | | | 530469 |
| 21 | CRANKCASE GROMMET, RIGHT SIDE | | | | 531107 |
| 22 | CHOKE LEVER BUSHING | | | | 73955 |

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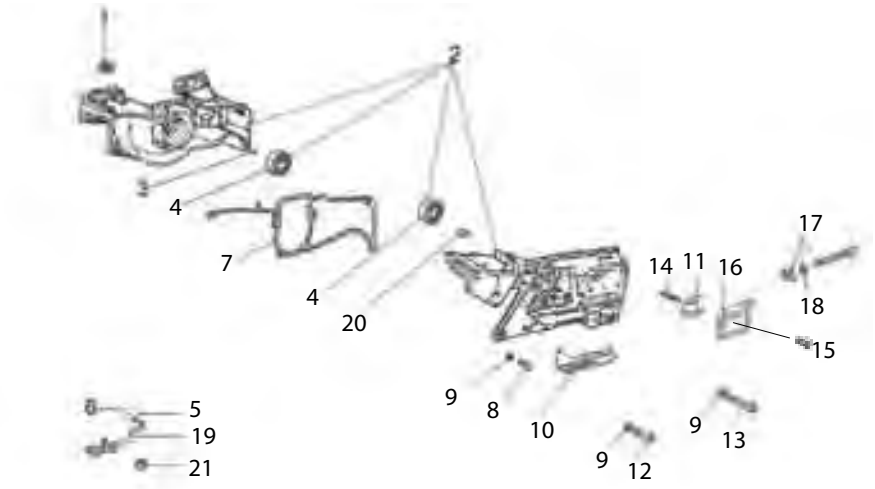
## CRANKCASE ASSEMBLY

# For saws with serial numbers starting 977.

**(see page 15 for serial number starting 967)**




| KEY | DESCRIPTION | TORQUE | | LOCTITE® 242 | PART NUMBER |
|---|---|---|---|---|---|
| | | Nm | in-lbs. | | |
| 1 | FUEL LINE GROMMET, CRANKCASE | | | | 73390 |
| 2 | CRANKCASE ASSEMBLY, RIGHT & LEFT | | | | 545967 |
| 3 | CRANKCASE DOWEL PIN | | | | 73281 |
| 4 | CRANKSHAFT BEARING | | | | 545969 |
| 5 | CHOKE LEVER SPLIT PIN | | | | 73927 |
| 6 | O-RING | | | | 71748 |
| 7 | CRANKCASE GASKET | | | | 545968 |
| 8 | CRANKCASE BOLT | 7.8 | 69 | X | 73930 |
| 9 | WASHER | | | | 73897 |
| 10 | CHAIN GUARD | | | | 528657 |
| 11 | BAR MOUNT PAD SPACER | | | | 71740 |
| 12 | COVER GUARD MOUNTING BOLT | 7.8 | 69 | X | 73397 |
| 13 | SCREW | 4.9 | 43 | X | 73379 |
| 14 | BAR MOUNTING STUD | 11.8 | 104 | | 73933 |
| 15 | SCREW | 7.8 | 69 | | 73284 |
| 16 | BAR MOUNT PAD COVER PLATE | | | | 71738 |
| 17 | PREMIUM TENSIONER KIT | | | | 73935 |
| 18 | TENSIONER SCREW RETAINER | | | | 73936 |
| 19 | CHOKE LEVER | | | | 530469 |
| 20 | CRANKCASE GROMMET, RIGHT SIDE | | | | 531107 |
| 21 | CHOKE LEVER BUSHING | | | | 73955 |



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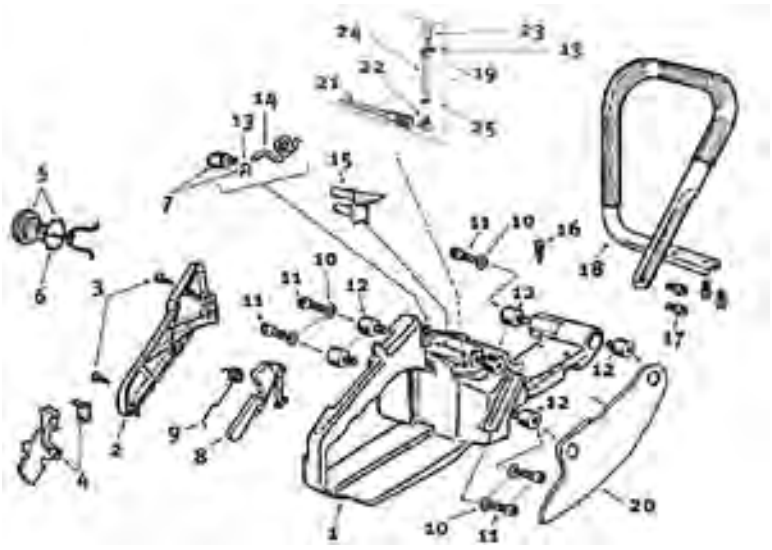
## FUEL TANK AND HANDLE ASSEMBLY

# For saws with serial numbers starting 967.

**(see page 18 for serial number starting 977)**



| KEY | DESCRIPTION | TORQUE | | LOCTITE® 242 | PART NUMBER |
|---|---|---|---|---|---|
| | | Nm | in-lbs. | | |
| 1 | FUEL TANK ASSEMBLY | | | | 528655 |
| 2 | REAR HANDLE HALF | | | | 531105 |
| 3 | SCREW | | | | 73976 |
| 4 | THROTTLE LEVER | | | | 530479 |
| 5 | FUEL CAP ASSEMBLY, WITH OUTER SEAL RING | | | | 530471 |
| 6 | FUEL CAP O-RING | | | | 73448 |
| 7 | FUEL FILTER | | | | 73459 |
| 8 | TRIGGER LOCKOUT LEVER | | | | 532028 |
| 9 | TRIGGER LOCKOUT LEVER SPRING | | | | 73988 |
| 10 | WASHER | | | | 73897 |
| 11 | SCREW | | | | 73982 |
| 12 | SHOCK ABSORBER | | | | 73980 |
| 13 | CLIP, FUEL FILTER | | | | 71588 |
| 14 | FUEL LINE | | | | 73375 |
| 15 | SHOCK ABSORBER, REAR HANDLE | | | | 71745 |
| 16 | BUMPER, SHOCK ABSORBER, FUEL TANK TOP | | | | 73270 |
| 17 | FRONT HANDLE BOLT | 7.8 | 69 | X | 73983 |
| 18 | FRONT HANDLE | | | | 509205 |
| 19 | FUEL BREATHER COMPLETE | | | | 71748 |
| 20 | WATER DEFLECTOR, BOTTOM | | | | 71766 |
| 21 | BREATHER TUBE BODY | | | | 71751 |
| 22 | BREATHER TUBE ELBOW | | | | 71759 |
| 23 | FUEL BREATHER, REMOTE | | | | 71761 |
| 24 | BREATHER TUBE EXTENSION | | | | 71777 |
| 25 | TUBE CLAMP | | | | 71760 |

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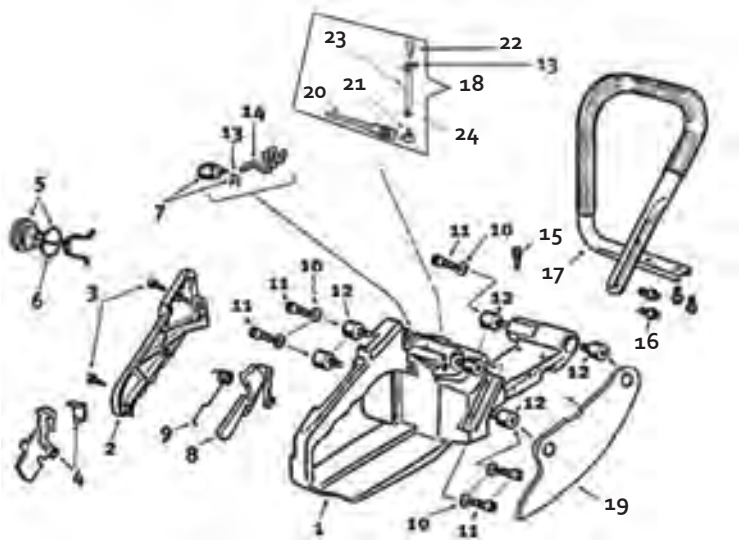
## FUEL TANK AND HANDLE ASSEMBLY

# For saws with serial numbers starting 977.

**(see page 17 for serial number starting 967)**




| KEY | DESCRIPTION | TORQUE | | LOCTITE® 242 | PART NUMBER |
|---|---|---|---|---|---|
| | | Nm | in-lbs. | | |
| 1 | FUEL TANK ASSEMBLY | | | | 528655 |
| 2 | REAR HANDLE HALF | | | | 531105 |
| 3 | SCREW | | | | 73976 |
| 4 | THROTTLE LEVER | | | | 530479 |
| 5 | FUEL CAP ASSEMBLY, WITH OUTER SEAL RING | | | | 530471 |
| 6 | FUEL CAP O-RING | | | | 73448 |
| 7 | FUEL FILTER | | | | 73459 |
| 8 | TRIGGER LOCKOUT LEVER | | | | 532028 |
| 9 | TRIGGER LOCKOUT LEVER SPRING | | | | 73988 |
| 10 | WASHER | | | | 73897 |
| 11 | SCREW | | | | 73982 |
| 12 | SHOCK ABSORBER | | | | 73980 |
| 13 | CLIP, FUEL FILTER | | | | 71588 |
| 14 | FUEL LINE | | | | 73375 |
| 15 | BUMPER, SHOCK ABSORBER, FUEL TANK TOP | | | | 73270 |
| 16 | FRONT HANDLE BOLT | 7.8 | 69 | **X** | 73983 |
| 17 | FRONT HANDLE | | | | 545971 |
| 18 | FUEL BREATHER COMPLETE | | | | 71748 |
| 19 | WATER DEFLECTOR, BOTTOM | | | | 71766 |
| 20 | BREATHER TUBE BODY | | | | 71751 |
| 21 | BREATHER TUBE ELBOW | | | | 71759 |
| 22 | FUEL BREATHER, REMOTE | | | | 71761 |
| 23 | BREATHER TUBE EXTENSION | | | | 71777 |
| 24 | TUBE CLAMP | | | | 71760 |



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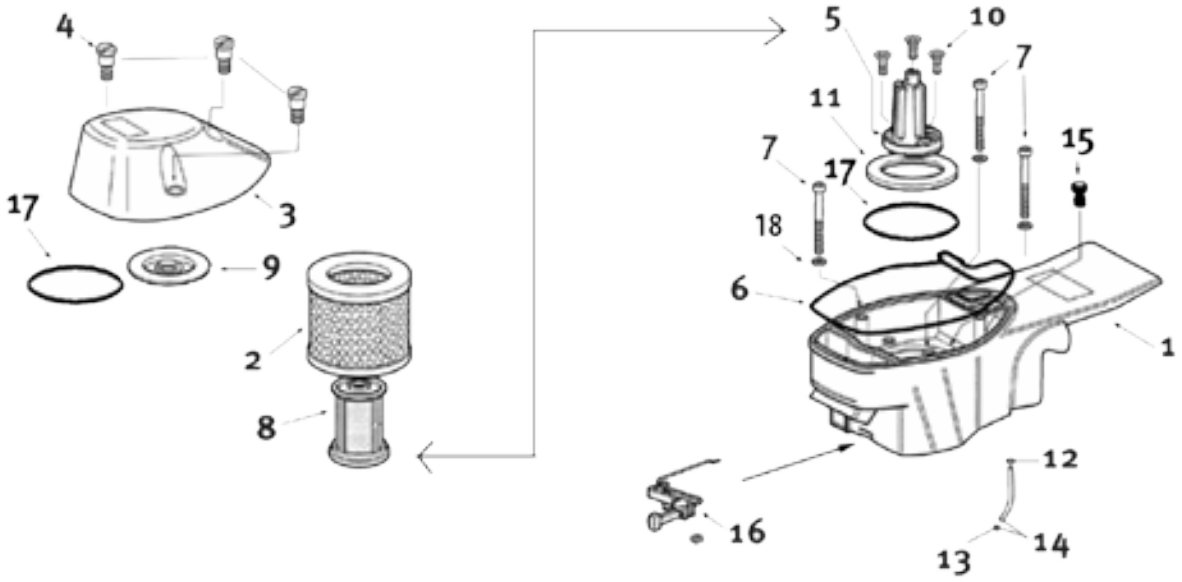
## AIR INTAKE ASSEMBLY

# For saws with serial numbers starting 967.

**(see page 20 for serial number starting 977)**




| KEY | DESCRIPTION | TORQUE | | LOCTITE® 242 | PART NUMBER |
|---|---|---|---|---|---|
| | | Nm | in-lbs. | | |
| 1 | CYLINDER COVER ASSEMBLY | | | | 71754 |
| 2 | AIR FILTER CANISTER, POLYESTER | | | | 71752 |
| 3 | AIR FILTER COVER | | | | 530473 |
| 4 | FILTER COVER SCREW | | | | 73992 |
| 5 | FILTER SUPPORT | | | | 73338 |
| 6 | FILTER COVER GASKET | | | | 71756 |
| 7 | SCREW, CYLINDER COVER, LONG, SOCKET HEAD | X | X | X | 71771 |
| 8 | PREFILTER PLASTIC, SECONDARY FILTER | | | | 73336 |
| 9 | AIR FILTER FLANGE | | | | 71758 |
| 10 | FILTER SUPPORT SCREW | 2.9 | 26 | X | 73337 |
| 11 | FILTER CANISTER GASKET | | | | 73335 |
| 12 | O-RING | | | | 71472 |
| 13 | TUBE CLAMP | | | | 71760 |
| 14 | COMPENSATOR TUBE | | | | 505382 |
| 15 | BREATHER GROMMET | 19.7 | 174 | | 71763 |
| 16 | THROTTLE ASSEMBLY | | | | 71750 |
| 17 | O-RING, AIR FILTER | | | | 73331 |
| 18 | WASHER | | | | 73897 |

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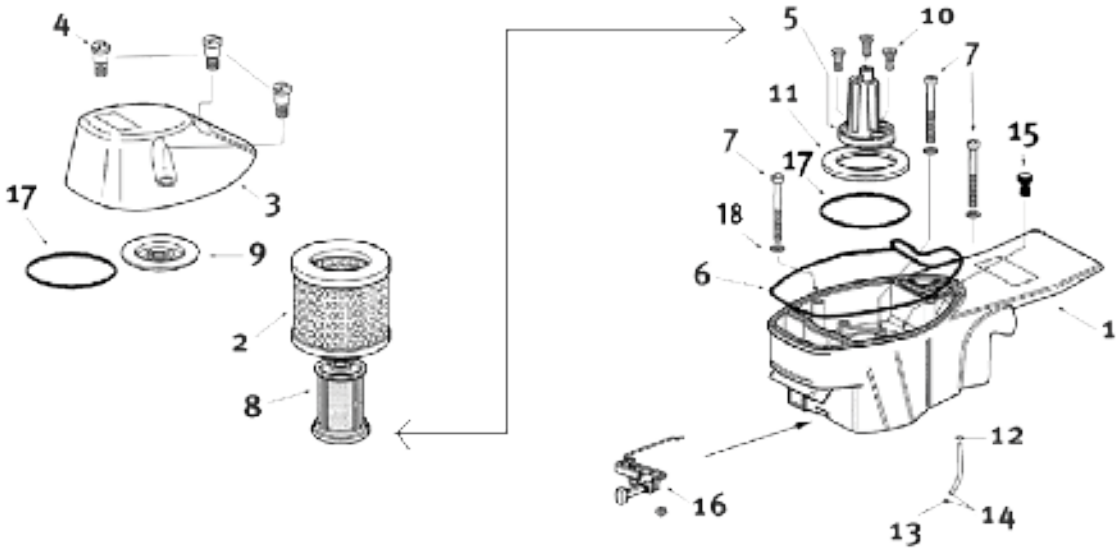
## AIR INTAKE ASSEMBLY

# For saws with serial numbers starting 977.

**(see page 19 for serial number starting 967)**




| KEY | DESCRIPTION | TORQUE | | LOCTITE® 242 | PART NUMBER |
|---|---|---|---|---|---|
| | | Nm | in-lbs. | | |
| 1 | CYLINDER COVER ASSEMBLY | | | | 545973 |
| 2 | AIR FILTER CANISTER, POLYESTER | | | | 71752 |
| 3 | AIR FILTER COVER | | | | 530473 |
| 4 | FILTER COVER SCREW | | | | 73992 |
| 5 | FILTER SUPPORT | | | | 73338 |
| 6 | FILTER COVER GASKET | | | | 71756 |
| 7 | SCREW, CYLINDER COVER, LONG, SOCKET HEAD | X | X | X | 71771 |
| 8 | PREFILTER PLASTIC, SECONDARY FILTER | | | | 73336 |
| 9 | AIR FILTER FLANGE | | | | 71758 |
| 10 | FILTER SUPPORT SCREW | 2.9 | 26 | X | 73337 |
| 11 | FILTER CANISTER GASKET | | | | 73335 |
| 12 | O-RING | | | | 71472 |
| 13 | TUBE CLAMP | | | | 71760 |
| 14 | COMPENSATOR TUBE | | | | 505382 |
| 15 | BREATHER GROMMET | 19.7 | 174 | | 71763 |
| 16 | THROTTLE ASSEMBLY | | | | 71750 |
| 17 | O-RING, AIR FILTER | | | | 73331 |
| 18 | WASHER | | | | 73897 |



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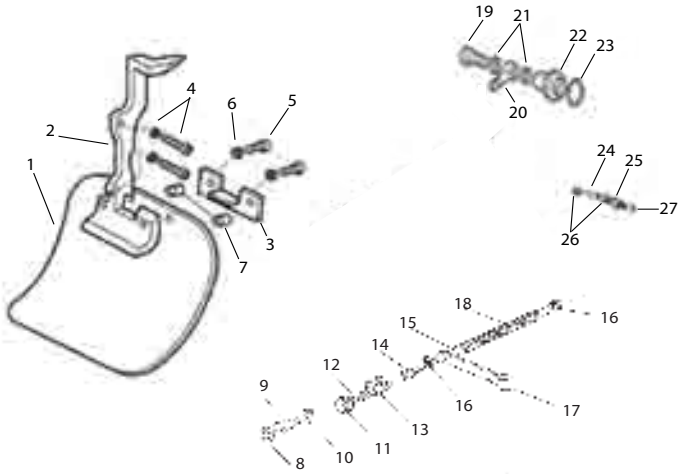
## WALL WALKER® AND WATER DELIVERY SYSTEM




**For saws with serial number starting 967 & 977**

| KEY | DESCRIPTION | SERIAL NUMBER STARTING | | TORQUE | | LOCTITE® | PART NUMBER |
|---|---|---|---|---|---|---|---|
| | | 967 | 977 | Nm | in-lbs. | 242 | |
| 1 | GUARD FLAP | X | X | | | | 71534 |
| 2 | WALLWALKER® LEVER ARM | X | X | | | | 71532 |
| 3 | GUARD FLAP CLAMP | X | X | | | | 71531 |
| 4 | SCREW & WASHER | X | X | | | | 505469 |
| 5 | GUARD FLAP SCREW | X | X | 4.8 | 43 | **X** | 71479 |
| 6 | WASHER | X | X | | | | 73951 |
| 7 | GUARD FLAP SPACER | X | X | | | | 71480 |
| 8 | WATER HOSE GASKET | | X | | | | 71469 |
| 9 | FITTING | X | X | | | | 71467 |
| 10 | CLIP | X | X | | | | 545975 |
| 11 | RING NUT | X | X | | | | 71457 |
| 12 | WATER HOSE O-RING | X | X | | | | 71468 |
| 13 | WATER SHUT-OFF VALVE | X | X | | | | 71458 |
| 14 | FITTING | X | X | | | | 71454 |
| 15 | TUBE | X | X | | | | 71455 |
| 16 | HOSE CLAMP | X | X | | | | 71465 |
| 17 | HOSE HANGER | X | X | | | | 71461 |
| 18 | WATER HOSE COVER | X | X | | | | 71464 |
| 19 | WATER HOSE SCREW | X | X | 19.7 | 174 | | 71463 |
| 20 | FITTING | X | X | | | | 71453 |
| 21 | COPPER WASHER | X | X | | | | 71456 |
| 22 | WATER TANK CAP | X | X | | | | 73923 |
| 23 | FUEL CAP O-RING | X | X | | | | 73448 |
| 24 | TUBE | X | X | | | | 71459 |
| 25 | FITTING | X | X | | | | 71470 |
| 26 | FITTING | X | X | | | | 71471 |
| 27 | O-RING | X | X | | | | 71472 |
| 28 | HOSE HANGER BUTTON | X | X | | | | 71744 |

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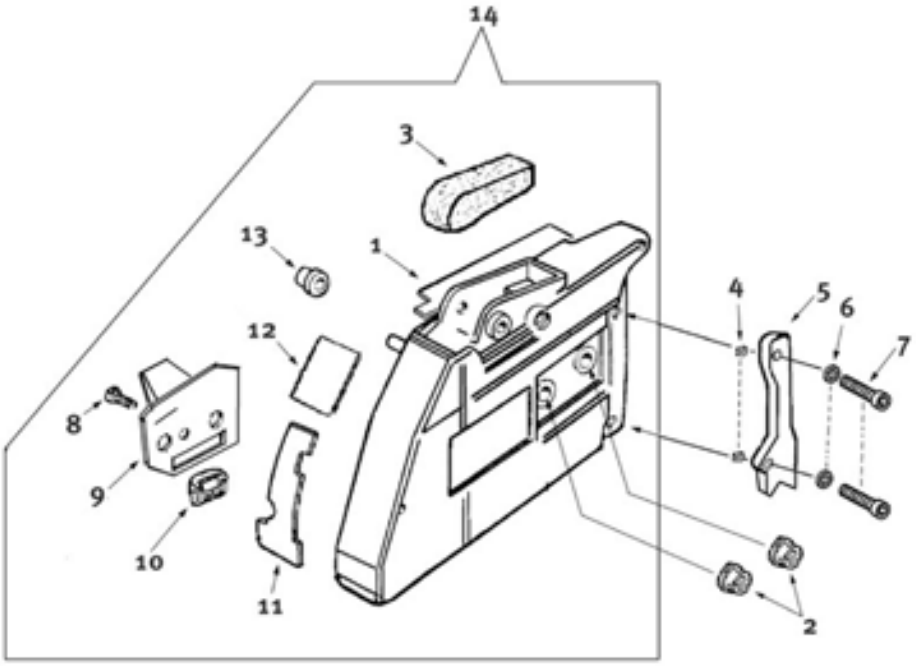
## SIDE COVER ASSEMBLY

# For saws with serial number starting 967 & 977




| KEY | DESCRIPTION | TORQUE | | LOCTITE® 242 | PART NUMBER |
|---|---|---|---|---|---|
| | | Nm | in-lbs. | | |
| 1 | SIDE COVER INSERT, TOP | | | | 71534 |
| 2 | SIDE COVER NUT | | | | 71532 |
| 3 | CHAIN COVER CAP | | | | 71531 |
| 4 | NUT | | | | 505469 |
| 5 | WALLWALKER® SIDE ARM | 4.8 | 43 | X | 71479 |
| 6 | WASHER | | | | 73951 |
| 7 | WALLWALKER® SIDE ARM SCREW | | | | 71480 |
| 8 | SCREW | | | | 71469 |
| 9 | SIDE COVER PLATE | | | | 71467 |
| 10 | LOWER GUARD | | | | 545975 |
| 11 | SIDE COVER INSERT, BOTTOM REAR | | | | 71457 |
| 12 | SIDE COVER INSERT, TOP REAR | | | | 71468 |
| 13 | RUBBER BUMPER COVER | | | | 71458 |
| 14 | SIDE COVER ASSEMBLY, COMPLETE | | | | 71454 |



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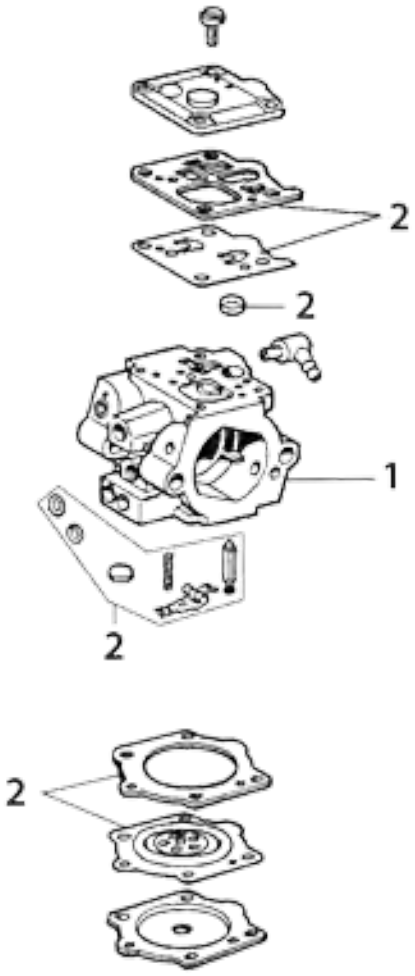
## CARBURETOR REPAIR KIT

# For saws with serial number starting 967 & 977




| KEY | DESCRIPTION | TORQUE | | LOCTITE® 242 | PART NUMBER |
|---|---|---|---|---|---|
| | | Nm | in-lbs. | | |
| 1 | CARBURETOR, WALBRO WJ-122B | | | | 528628 |
| 2 | CARBURETOR REPAIR KIT | | | | 73996 |

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**5. This section covers the disassembly, inspection and assembly air induction system.**

5.1

Loosen the air filter cover screws and remove air filter cover.

5.2

Remove air filter from cover.

A. Inspect air filter

B. Replace if necessary

5.3

Clean filter with cleaning solution and a nylon brush.

A. Clean filter with cleaning solution and water.

B. Let dry and reinstall.

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5.4

Inspect air filter cover gasket.

A. Replace if permanently depressed or hard, due to slurry.

5.5 Inspect filter canister gasket.

A. Clean

B. Replace if necessary

5.6

Check air filter mount screws and lightly secure them if they are loose.

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## 6. This section covers the removal, inspection and installation of the spark plug.

6.1

Remove spark plug cap and spring (spring is located inside of the cap).

6.2

Loosen and remove the spark plug.

6.3

Inspect spark plug for damage or corrosion. Clean with a wire brush.

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6.4

Gap if necessary to 0.02" (0.5mm).

**NOTE:**

If the spark plug must be replaced, refer to the spark plug reference guide at the end of this manual to select the correct replacement plug.

6.5

Assemble in the reverse order.

Make sure the plug boot is seated completely.

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**7. This section covers clutch removal, rim sprocket removal, inspection and assembly. Refer to sections 5 and 6 if needed.**

7.1

Insert piston stop tool into spark plug hole.

7.2

Pull starter handle until piston stops against tool.

7.3

Remove clutch

**⚠ CAUTION** Left hand threads - rotate clockwise to loosen.

**NOTE**: If an impact wrench is available steps 7.1 and 7.2 do not need to be performed.

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7.4

Remove all drive components.

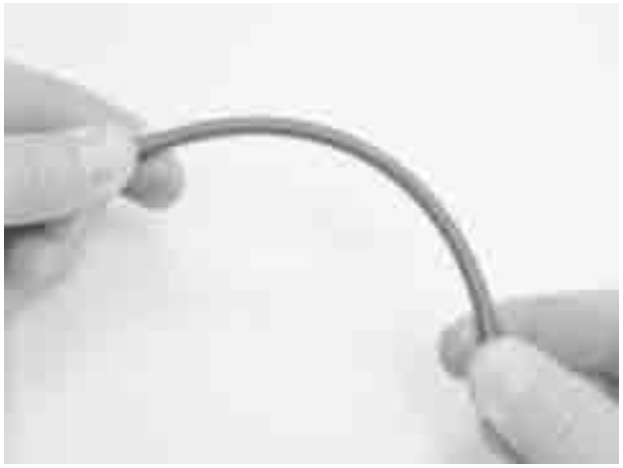
7.5

Inspect the clutch shoes for wear.

A. Replace if the shoe has less than 0.04" (1 mm) of material, as shown.

7.6

Inspect spring for cracks.

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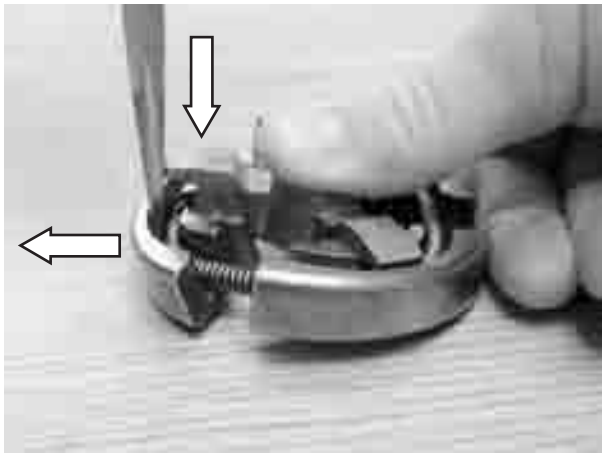
7.7

Assemble clutch shoes as shown.

7.8

Finish installation of clutch shoe as shown.



7.9

Inspect the rim sprocket for wear.

A. Replace if the rim sprocket teeth are worn to points, as shown on right.

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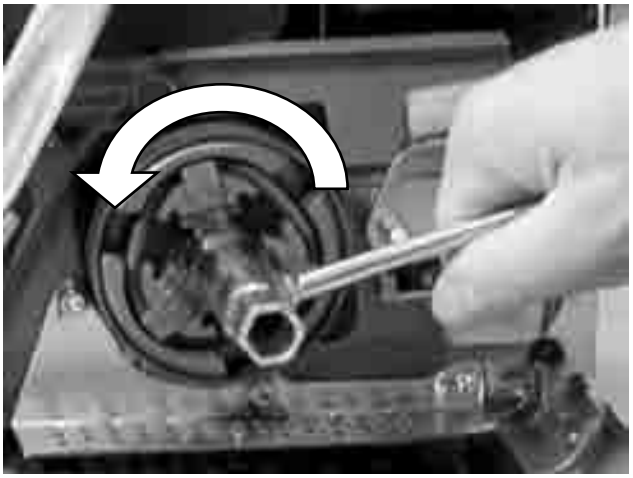
7.10

Clean and Assemble.

A. Clean all parts in solvent.

B. Grease clutch cup bearing with a waterproof grease.

C. Assemble clutch spacer washer, bearing, clutch cup with rim sprocket, and inside clutch spacer washer.



7.11

Install clutch.

Torque to 295 in-lbs (33.3 Nm).

**⚠ CAUTION** Left hand threads.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**8. This section covers the removal of the starter cover, replacement of the starter rope, and replacement of the recoil spring.**

8.1

Remove starter cover screws (4).

8.2

Remove starter cover assembly from saw.

8.3

Remove starter cord shield screws.

8.4

Relieve spring tension.

A. Pull 4-6" (10-15 cm) of rope out.
B. Line rope up with notch on pulley.
C. Slowly rotate pulley counter-clockwise until spring pressure is released. Use thumb as brake.

8.5

Remove starter pulley screw and washer.

**NOTE:** Hold starter cover firmly.

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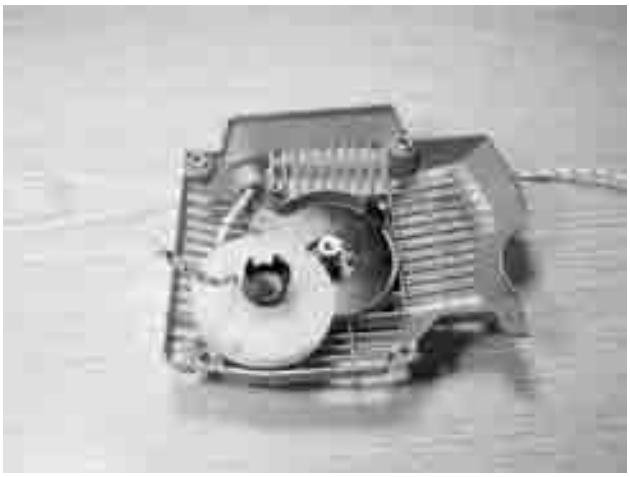
8.6

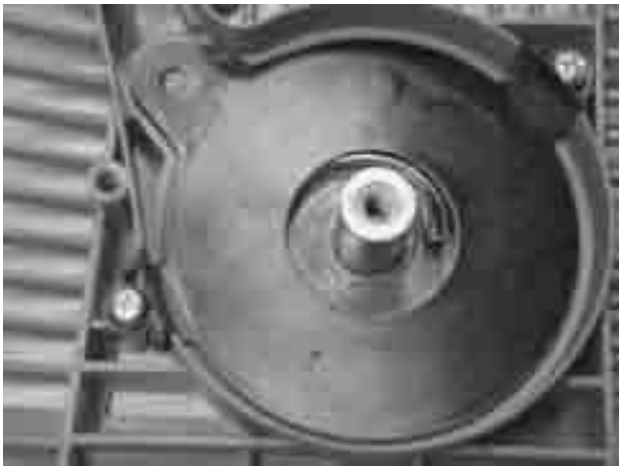
Remove starter pulley.



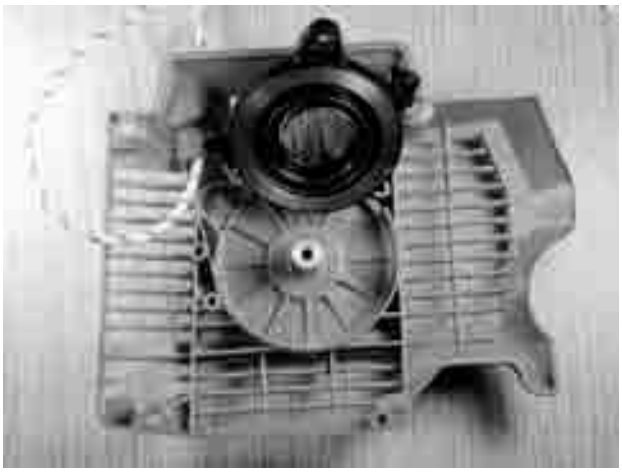
8.7

Inspect coil spring.

A. Replace if spring hook is damaged. Attemping to re-bend the spring hook may cause the hook to break off.



B. Carefully remove coil spring and housing to prevent spring from unwinding.



8.8 Lubricate with lightweight oil.

8.9 Replace parts carefully.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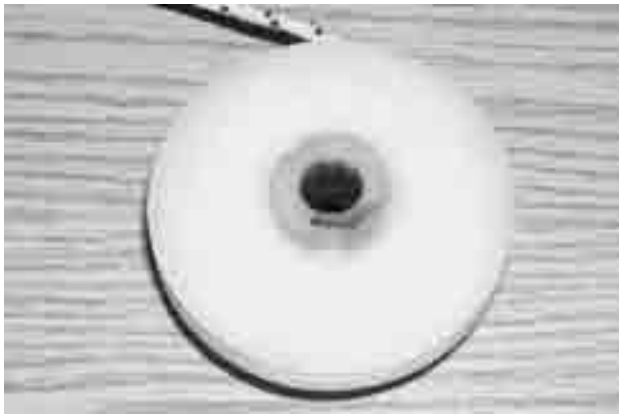
8.10

Inspect pulley spring catch.

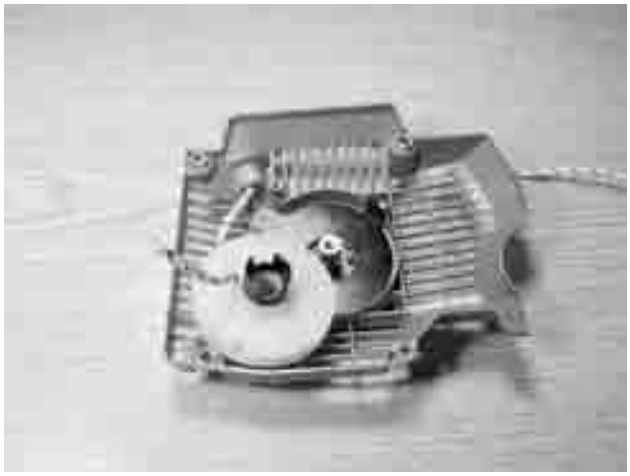
A. Clean with cleaning solution.

B. Replace if worn or broken.



8.11

Install starter rope and tie knot.



8.12

Install pulley.

A. Wind rope onto pulley clockwise leaving 4-6" (10-15 cm) out.

B. Make sure that the pulley spring catch is in the spring hook.

8.13

Install center screw, spacer and washer.

A. Use Loctite® 242.

B. Torque to 26 in-lbs (2.9 Nm).

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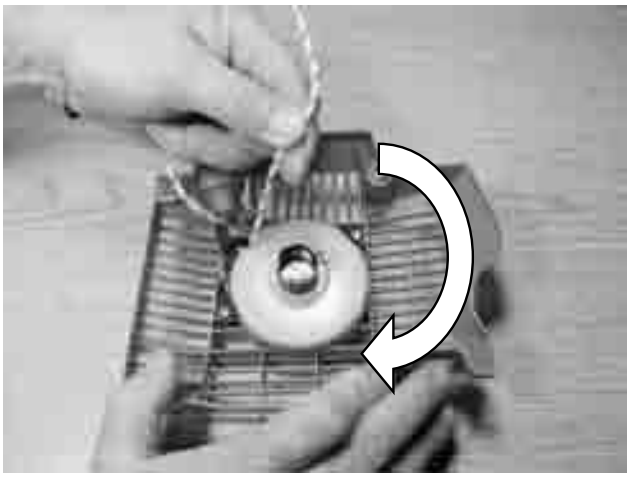
8.14

Wind the recoil spring.

A. Line rope up with notch on pulley.

B. Rotate the pulley with the rope clockwise 5 times.

C. Untangle rope and release.



8.15

Assemble starter cord shield.

8.16

Remove starter pawl screws, pawls, spring and plain washer.

NOTE: Piston stop tool may be required to remove the starter pawl screws.

8.17

Inspect and clean pawl components.

A. Inspect the components. Replace if necessary.

B. Clean the components with a brush and solvent.

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8.18

Assemble components

A. Make sure the spring is in the correct position.

B. Use Loctite® 242 on the pawl screws.

C. Torque to 60 in-lbs. (6.8 Nm).

8.19

Install starter cover.

A. Pull out cord 4-6" (10-15cm).

B. Slowly release while placing cover to allow pawls to engage.

8.20

Install starter cover screws.

A. Use Loctite® 242.

B. Torque to 60 in-lbs. (6.8 Nm).

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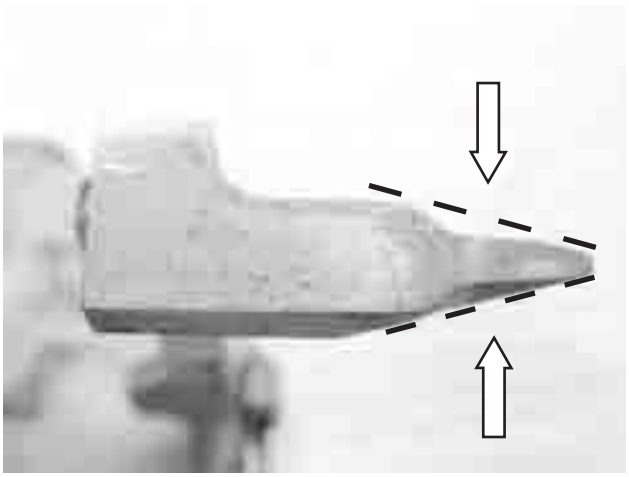
# 9. This section covers the removal, inspection and assembly of the WallWalker® and guard flap.

9.1

Inspect WallWalker® tip.

A. If the tip is worn, as shown, replace.



9.2

Remove bar mount pad.

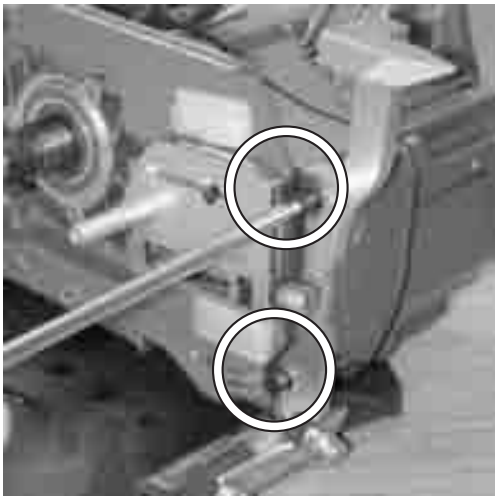
9.3

Remove crankcase screws and wave washers.

Remove WallWalker® from saw.

Install new WallWalker®.

Assemble in reverse order.

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9.4

Remove guard flap screws and washers.

9.5

Remove and inspect guard flap.

A. Replace the flap if it is torn or damaged in any way.

9.6

Reassemble in the reverse order.

A. Install guard flap screws and washers.

B. Use blue Loctite® 242.

C. Torque to 43 in-lbs. (4.8 Nm).

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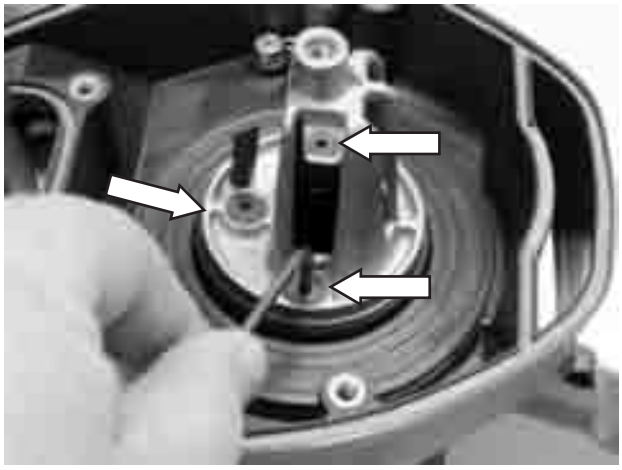
**10 This section covers the disassembly and assembly of the cylinder cover. Removal of the air intake components and front handle is necessary. Refer to sections 1 and 14 if needed.**

10.1

Remove the air filter mount screws.



10.2

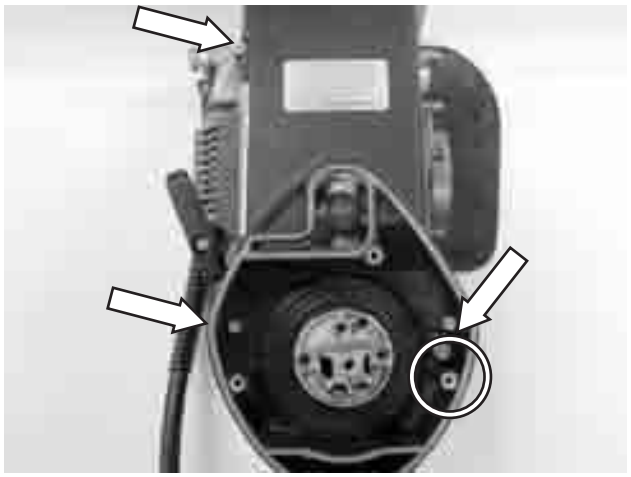
Remove the cylinder cover screws (3).

10.3

Remove spark plug lead from cylinder cover.

10.4

Remove fuel tank breather cap and clamp.



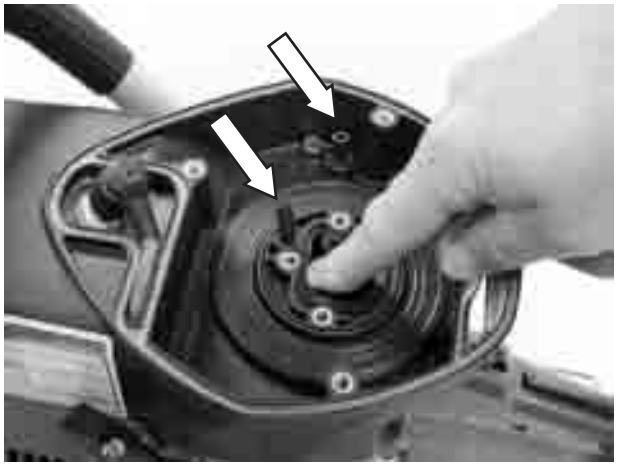
10.5

Partially remove intake manifold from cylinder cover.

10.6

Remove cylinder cover.

A. Pull up on front.
B. Push intake manifold through hole.
C. Make sure throttle linkage is disengaged from cylinder cover.
D. Guide fuel breather tube and compensator tube through cylinder cover.

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10.7

Remove stop switch leads.

10.8

Inspect cylinder cover for damage.

A. Replace if necessary.

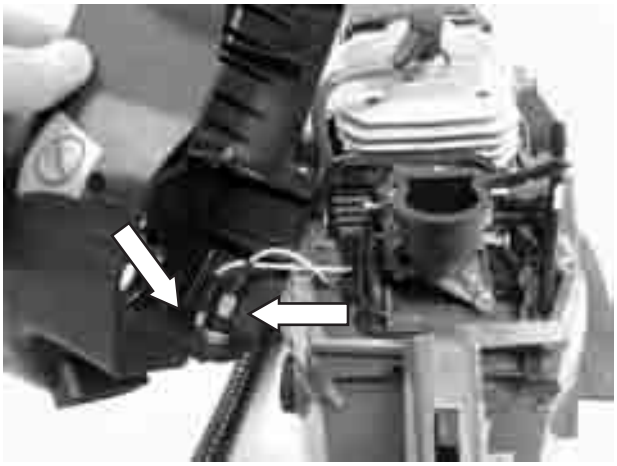
10.9

Check cylinder cover water seal and filter cover gasket are in place and in good condition.

A. Replace if necessary.

10.10

Reassemble stop switch leads.



**screw boot**

10.11

Make sure carburetor screw boot is in place.

10.12

Lubricate compensating tube and fuel tank breather tube with soapy water, guide through cylinder cover (install compensating tube first).

NOTE:
Be careful as to not pull tubes away from their point of connection. Approximately 3/4" 2 cm) of tube should protrude from cylinder cover.

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10.13

Install cylinder cover.

A. Pull spark plug lead into slot in cylinder cover.
B. Align throttle linkage with cylinder cover and crankcase.
C. Push the cylinder cover down on the crankcase, guide intake manifold into cylinder cover.
D. Install the cylinder cover screws. Use Loctite® 242. Torque to 35 in-lbs. (4.0 Nm).
E. Install fuel tank breather and clamp.

10.14

Install air filter mount.

A. Guide carburetor compensating tube through air filter mount. Make sure manifold sits flat over lip on cylinder cover.
B. Install air filter mount screws (3) using Loctite® 242.
C. Torque to 43 in-lbs (4.9 Nm.)

10.15

Install air filters and cover.

A. Install pre-filter.
B. Install clean air filter.
C. Install air filter flange and tighten.
D. Install air filter cover and tighten.

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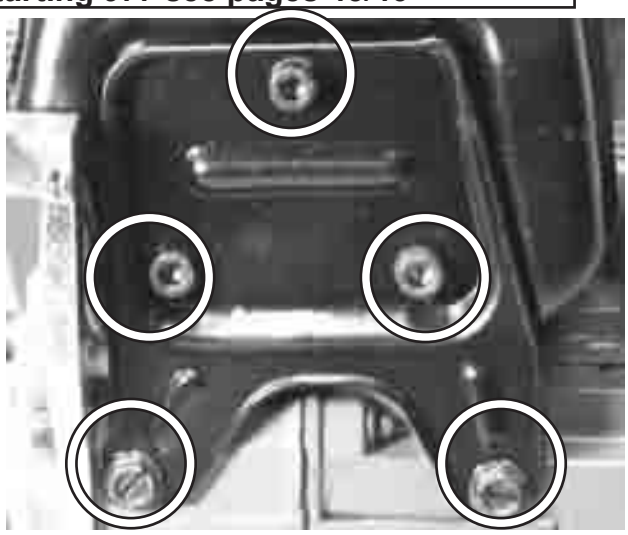
**11. This section covers the disassembly, inspection, and assembly of the muffler. Removal of the WallWalker® and cylinder cover is necessary. Refer to sections 7 and 10 if necessary.**

**For saws with serial number starting 967,**
**for saws with serial number starting 977 see pages 45/46**

11.1

Remove muffler support screws.



11.2

Remove muffler screws and serrated washers located inside the muffler.

11.3

Remove muffler and heat shield gasket.

A. Replace any damaged components.

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**For saws with serial number starting 967,**
**for saws with serial number starting 977 see pages 45/46**

11.4

Install muffler.

A. Insert muffler screws and serrated washer (2) into muffler.

B. Hold muffler screws in place with heat shield gasket.

C. Thread muffler screws into cylinder, torque to 78 in-lbs. (8.8 Nm).

11.5

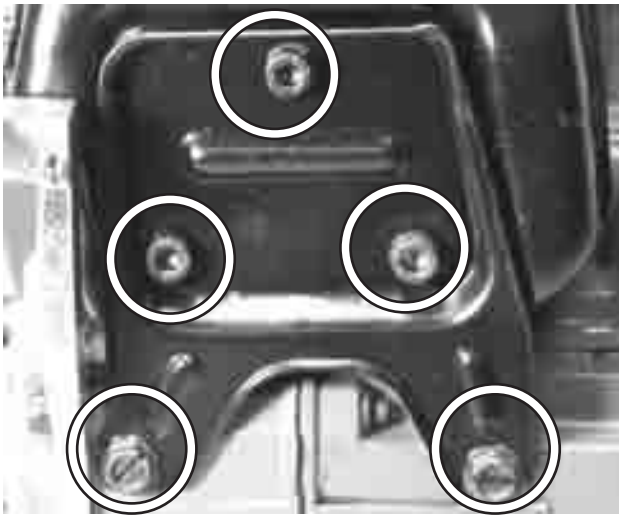
Install muffler support.

A. Install top (3) muffler support screws and serrated washer finger tight.

B. Install bottom (2) muffler support screws with Loctite®242.

C. Torque top screws to 78 in-lbs. (8.8 Nm).

D. Torque bottom screws to 52 in-lbs. (5.8 Nm).

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**11. This section covers the disassembly, inspection, and assembly of the muffler. Removal of the WallWalker® and cylinder cover is necessary. Refer to sections 7 and 10 if necessary.**

**For saws with serial number starting 977,**
**for saws with serial number starting 967 see pages 43/44**

11.1

Remove muffler support screws.

11.2

Remove muffler screws located inside the muffler.

11.3

Remove muffler and heat shield gasket.

A. Replace any damaged components.

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**For saws with serial number starting 977,**
**for saws with serial number starting 967 see pages 43/44**

11.4

Install muffler.

A. Insert muffler screws (2) into muffler.

B. Hold muffler screws in place with heat shield gasket.

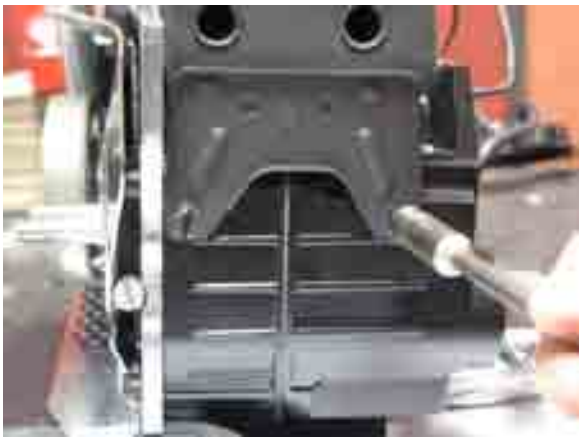
C. Thread muffler screws into cylinder with Loctite®242. Torque to 78 in-lbs. (8.8 Nm).

11.5

Install bottom (2) muffler support screws with Loctite®242.

A. Torque top screws to 78 in-lbs. (8.8 Nm).

B. Torque bottom screws to 52 in-lbs. (5.8 Nm).

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**12. This section covers the removal and insallation of the carburetor. Removal of the air intake components and cylinder cover is required. Please refer to section 5, 10 or 11 if necessary. Carburetor tuning is covered in section 23.**

NOTE: All saws are equipped with carburetor model WJ-122B.

12.1

Remove throttle linkage.

A. Push trigger end out of rear handle.

B. Pivot linkage around.

C. Remove carburetor end of linkage from throttle rod tab on carburetor.

12.2

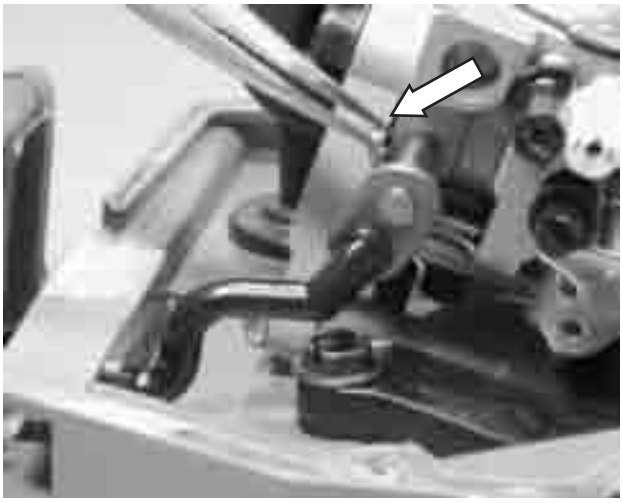
Remove choke lever split pin.

12.3

Remove choke lever.

12.4

Remove adjustment screw boot.



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12.5

Remove carburetor support screw (1) with #4 Torx or straight blade screwdriver.

12.6

Remove carburetor body screws (2).

12.7

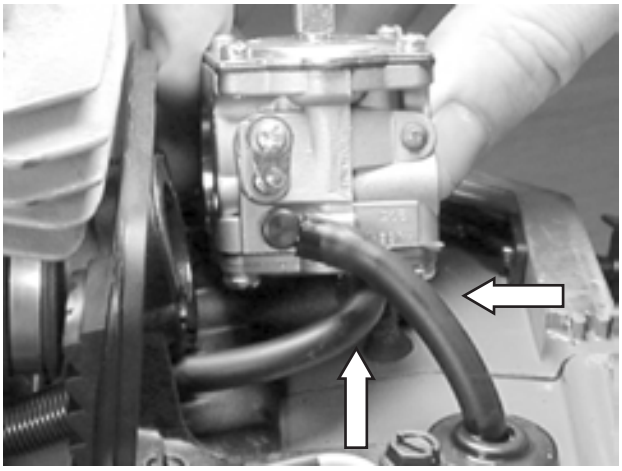
Remove fuel line.

12.8

Remove pulse tube.

12.9

Remove carburetor compensator tube on top of carburetor.



12.10

Assemble in the reverse order.

A. Torque carburetor body screws to 43 in-lbs. (4.9 Nm).

B. Torque supporter screw with blue Loctite® to 43 in-lbs. (4.9 Nm).

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**13. This section covers the removal, inspection and assembly of the cylinder, piston and related components. Removal of several component groups is required. Refer to sections 5, 6, 10 and 12 if necessary.**

**NOTE:**

When replacing the 680GC cylinder and piston it is necessary to tune the carburetor prior to returning the saw to service. See section 23.

13.1

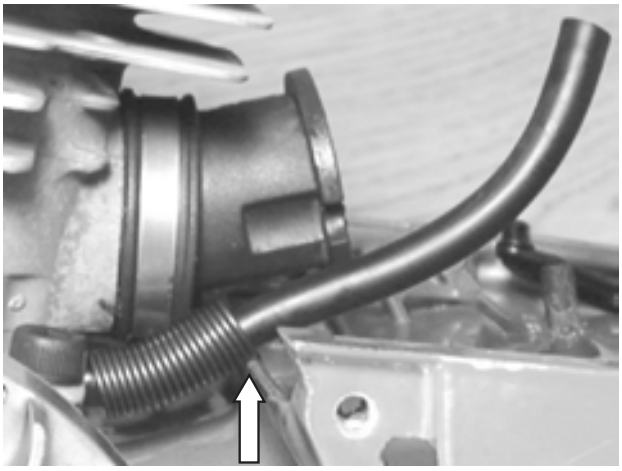
Remove carburetor base screws.

A. Remove carburetor base from rear manifold. Push rear manifold through carburetor base while holding carburetor base.

B. Remove carburetor base from pulse tube.

13.2

Remove pulse tube and protective spring from cylinder base.



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13.3

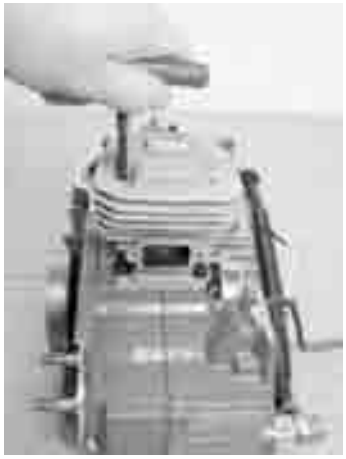
Remove rear manifold clamp.

13.4
Remove rear manifold from cylinder.

A. Inspect for holes and tears in the manifold, replace if damaged.

13.5

Remove cylinder screws (4) and wave washers.



13.6

Remove cylinder.

A. Remove cylinder gasket and clean crankcase mating surface.

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13.7

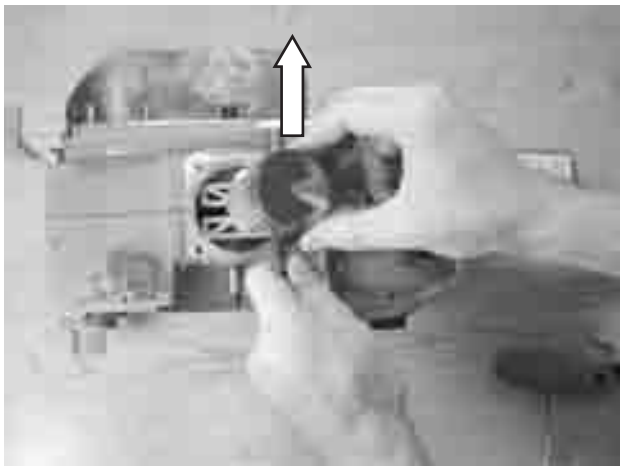
Remove wrist pin retaining clips (2)

13.8

Press wrist pin out with an 8mm deep socket.

13.9

Remove piston and inspect. Replace if damaged.



13.10

Remove wrist pin bearing.

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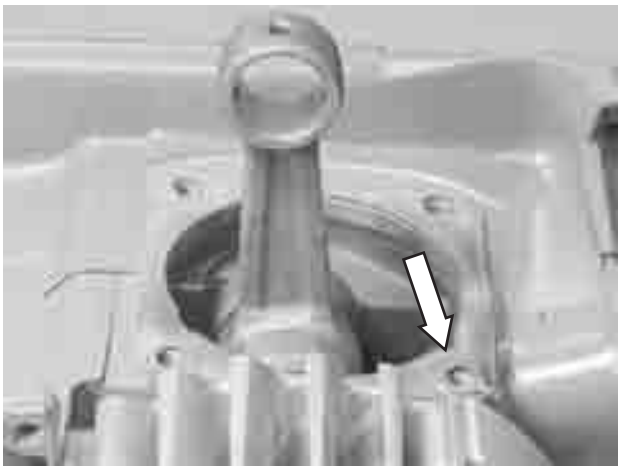
13.11

Cylinder gasket.

A. Oil gasket with ICS® 2-stroke engine oil.
B. Install and align holes and notch.



13.12

Install wrist pin bearing in rod.

A. Oil bearing with ICS® 2-stroke engine oil.

13.13

Install rings.

Install bottom ring first. Installing the bottom ring over the top ring may cause the ring to break.

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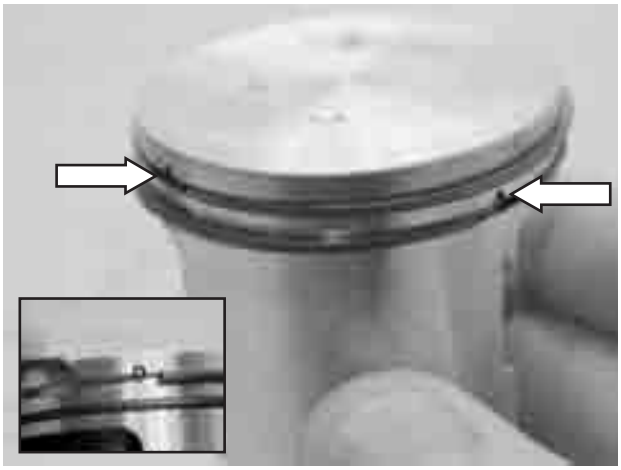
13.14

Ring orientation.



13.15

Install (1) wrist pin retaining clip.

13.16

Make sure wrist pin retaining clip is in the proper orientation.

⚠ Improper installation may result in serious engine damage.

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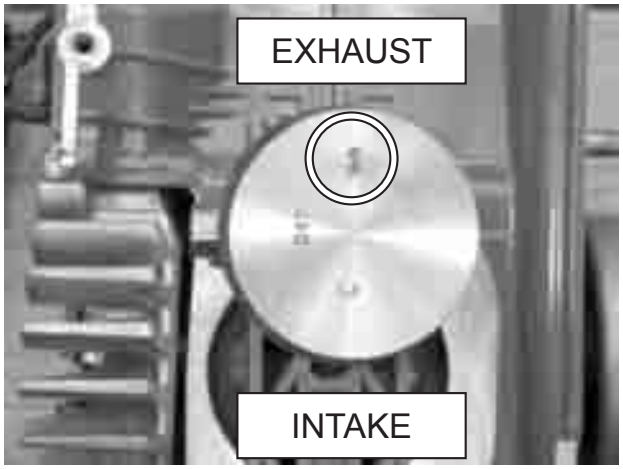
13.17

Partially install wrist pin.

13.18

Align piston in correct orientation.




13.19

A. Oil piston with ICS® 2-stroke oil.
B. Align wrist pin with wrist pin bearing.
C. Complete wrist pin installation.
D. Install second wrist pin retaining clip.

⚠ Make sure wrist pin retaining clip is in the proper orientation (see 13.16).

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13.20

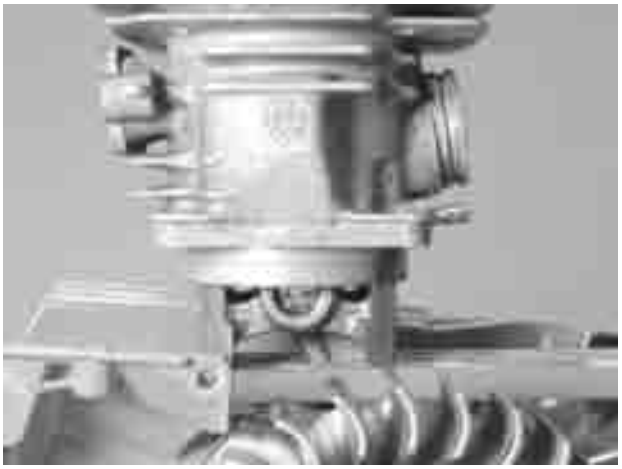
Install cylinder.

A. Lubricate cylinder bore with ICS® 2-stroke oil.
B. Compress rings with ring compression tool.
C. Slide cylinder onto piston, pushing ring compression tool down.

13.21

Install cylinder.

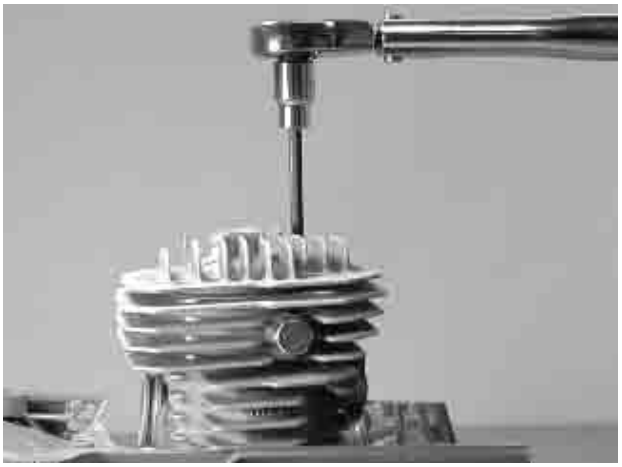
A. Remove ring compression tool.
B. Slide cylinder down piston and into crankcase.
C. Align cylinder bolt holes with crankcase.



13.22

Install 4 cylinder screws and washers.

A. Use Loctite®242.
B. Torque bolts to 95 in-lbs. (10.7 Nm).



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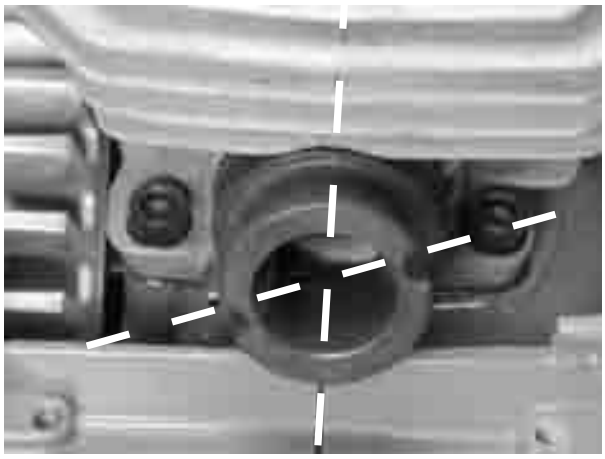
13.23

Install rear manifold.

A. Lubricate rear manifold with ICS® 2-stroke oil.
B. Push rear manifold onto cylinder intake.
C. Align rear manifold seam with cylinder and crankcase seam.

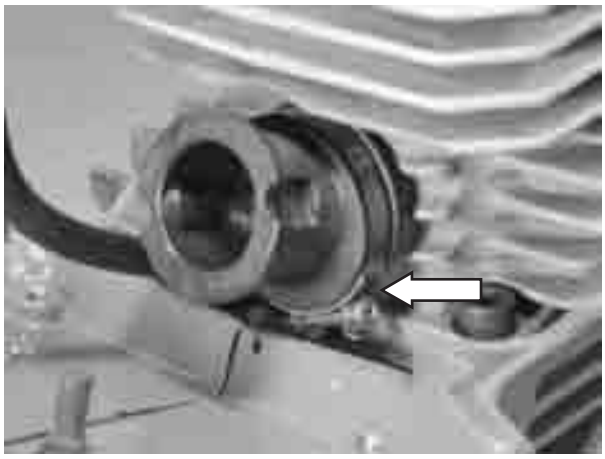


13.24

Install rear manifold clamp.

A. Torque to 11 in-lbs. (1.2 Nm).

⚠ Do not over tighten, damage to rear manifold may cause engine damage.

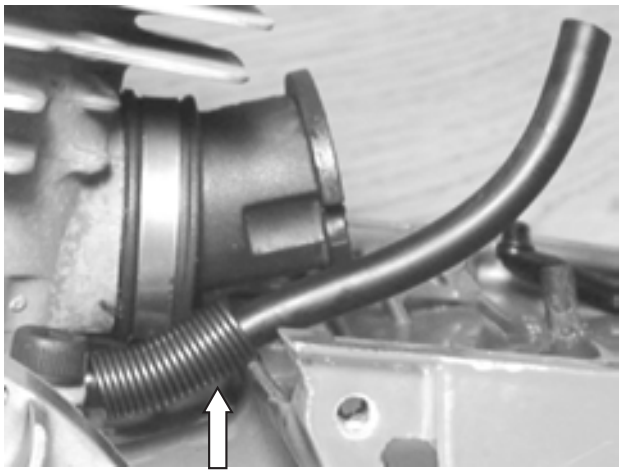


13.25

Install the pulse tube onto cylinder barb.

13.26

Install protective spring onto pulse tube.

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13.27

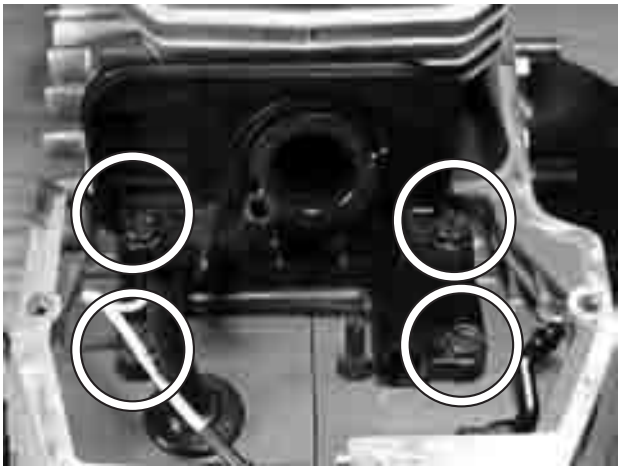
Install carburetor base.

A. Slip pulse tube into and through carburetor base.
B. Slip rear manifold into and through carburetor base.
C. Make sure rear manifold lip is flat.

13.28

Install carburetor base screws.

A. Use Loctite® 242 on (3) screws without ground wire.
B. Make sure to include stop switch wire (installed on left rear screw).
C. Torque to 35 in-lbs. (4 Nm).



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## 14. This section covers water hose and water tank cap.

14.1

Loosen hose clamp screw.

14.2

Remove water connection from hose.

14.3

Remove hose from hose hanger.

14.4

Remove water hose connector.

14.5

Unscrew water tank cap from saw (7/8 wrench).

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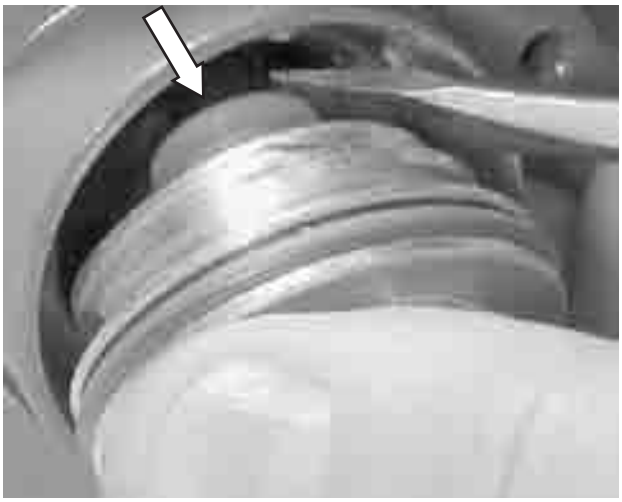
14.6

Release water tank cap from water tank tube.

A. Depress orange fitting (as shown) to release water tank tube.



14.7

Assemble in reverse order.

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**15. This section covers the removal, inspection, and installation of the ignition coil. Removal of the starter is required. Refer to section 8 if necessary.**

15.1

Remove starter flywheel shroud by unhooking wires.

15.2

Remove ignition coil screws, wave washers and plain washers.

15.3

Remove ignition coil.

15.4

Inspect.

A. Look for cracks/missing insulation.

B. Clean flywheel magnets and coil if rusty.

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15.5

Install ignition coil.

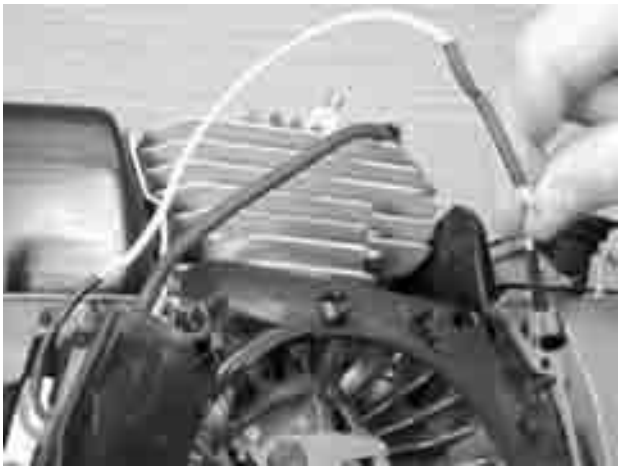
A. Place ignition coil shim (0.012")
B. Set ignition coil in place.
C. Install ignition coil screws, wave washers, and plain washers with Loctite® 242.
D. Holding shim, rotate flywheel magnet around to coil.
E. Torque ignition coil screws to 26 in-lbs.(3 Nm).
F. Remove shim, rotate flywheel to check clearance.

15.6

Install flywheel shroud.

15.7

Route ignition stop switch wire through crankcase into carburetor chamber.



15.8

Complete ignition wire routing.

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**16. This section covers the removal, inspection, and installation of the flywheel. Removal of the starter and spark plug is requried. Refer to sections 6 and 8 if necessary.**

16.1

Insert piston stop.

16.2

Remove flywheel nut, wave washer, and plain washer.

16.3

Screw on flywheel removal tool finger tight. Unscrew tool 1 1/2 turns leaving approximately 1/8 inch (5 mm) space between tool and flywheel.

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16.4

Using pliers, hold saw up by magnet counterweight.

16.5

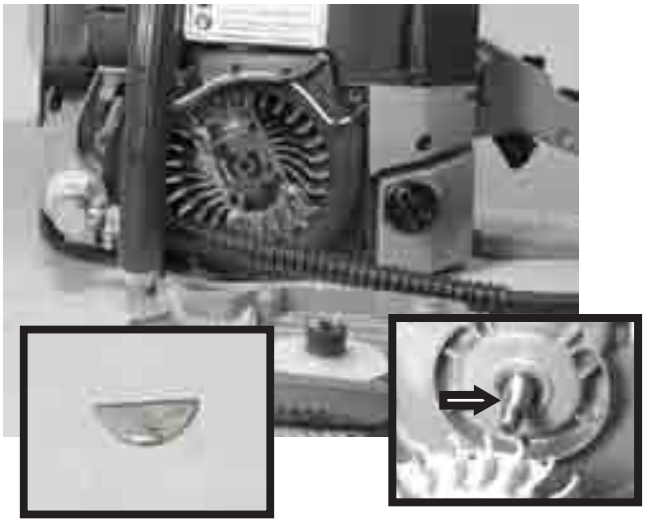
Strike flywheel removal tool with a ball peen hammer. The flywheel should release from crankshaft.

16.6

Inspect and clean flywheel. Replace if any of the fins are broken.

16.7

Inspect woodruff key.



16.8

Install flywheel, plain washer, wave washer, and flywheel nut.

A. Torque nut to 260 in-lbs (29.3 Nm.)

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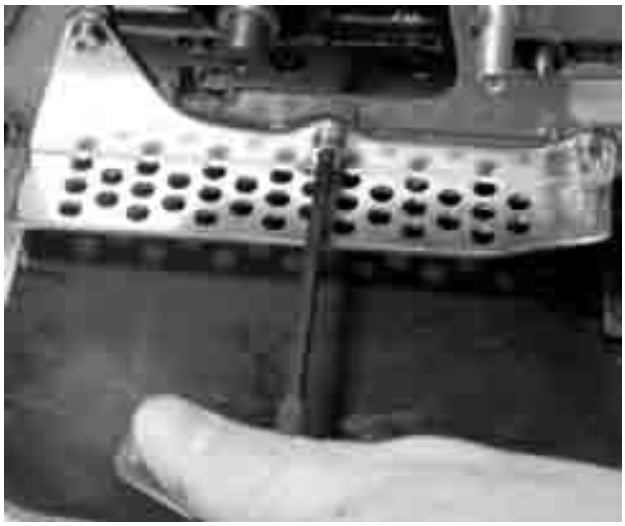
**17. This section covers the removal, inspection, and installation of the bottom guard.**

A. Remove bottom guard screws and split washers.
B. Inspect bottom guard.
C. Replace if damaged.
D. Assemble in reverse order.

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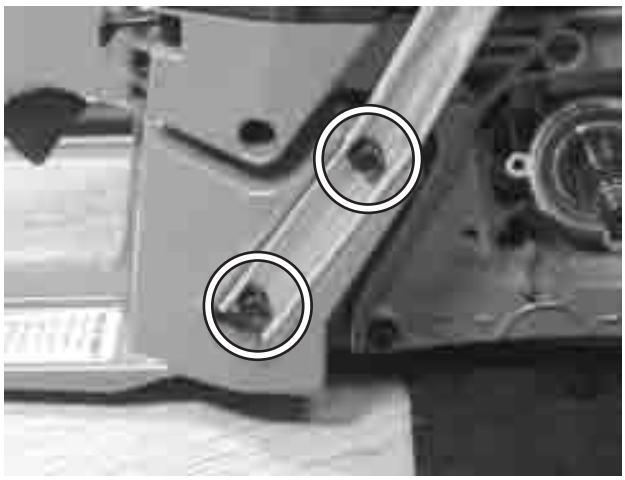
**18. This section covers the removal, inspection, and installation of the front handle.**

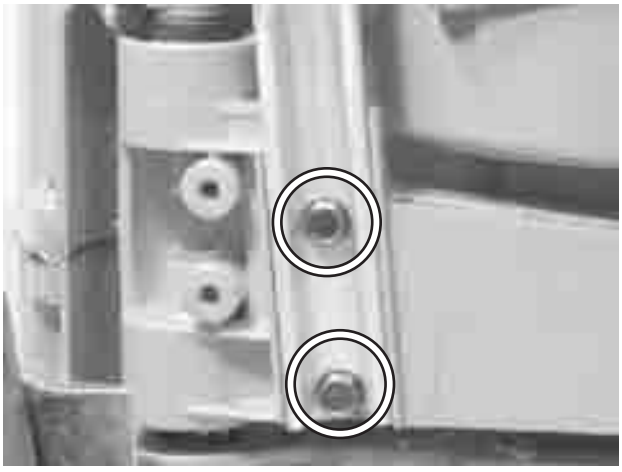
18.1

Remove front handle screws on right side.



18.2

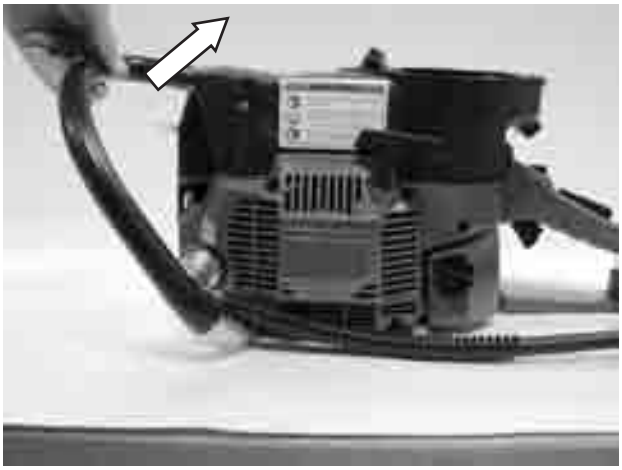
Remove front handle screws on bottom.



18.3

Install front handle

A. Roll front handle into place.
B. Install front handle screws (4).
C. Use Loctite®242.
D. Torque to 69 in-lbs. (7.8 Nm).



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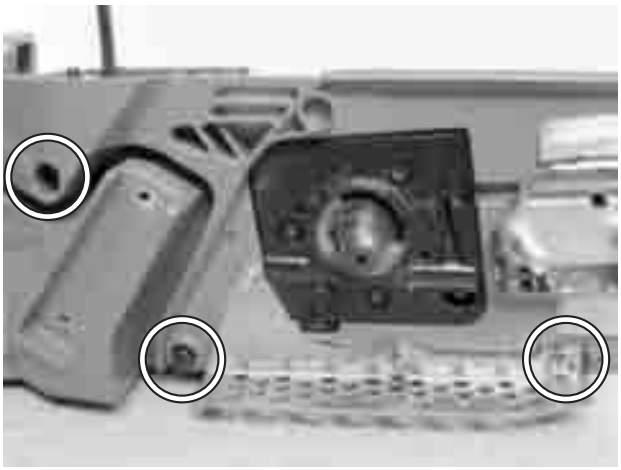
**19. This section covers the disassembly, inspection, and assembly of the vibration isolators, fuel tank and rear handle.**

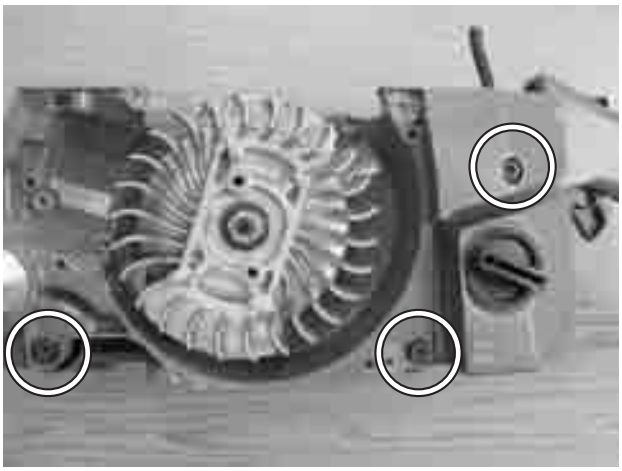
19.1

Remove vibration isolator screws and wave washers on clutch side of saw.



19.2

Remove vibration isolator screws and wave washers on flywheel side of saw.

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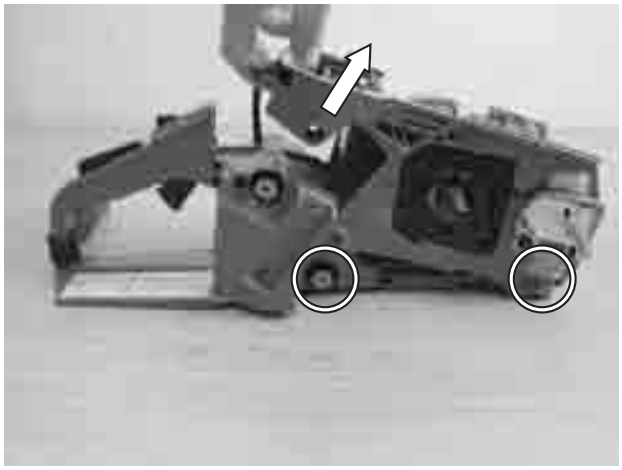
19.3

Separate crankcase and fuel tank.

NOTE: Saws have a rubber water deflector connected to the (2) bottom vibration isolators on the clutch side (circled).



19.4

Remove vibration isolators from fuel tank (6) if necessary.

* Shock absorber tool p/n #71546 should be used for removal and installation.

19.5

Assemble in reverse order.

NOTE: During assembly be careful to avoid kinking the fuel line.

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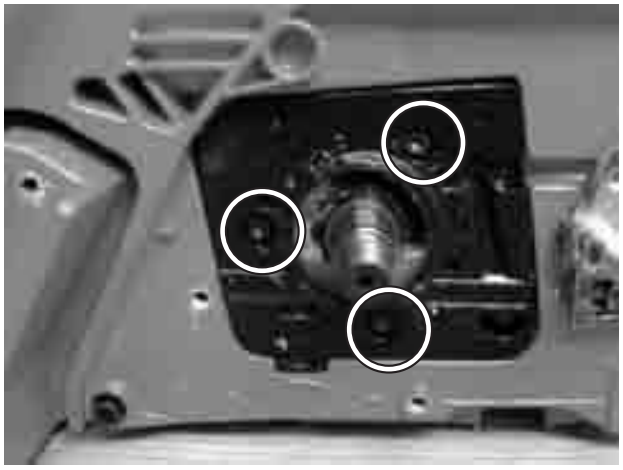
**20. This section covers the removal, inspection and assembly of the crankcase seals and crankshaft bearings.**

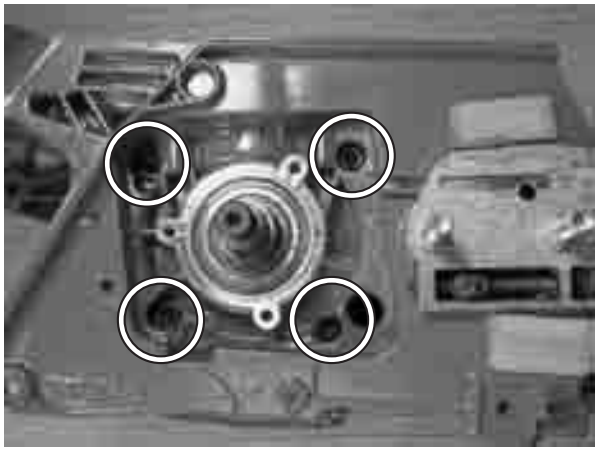
20.1

Remove outer crankshaft seal housing screws and wave washers.



20.2

Remove crankcase bolts.



20.3

Heat the flywheel side crankcase with heat gun for 5 minutes, approximately 150° F (65.5° C).

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20.4

Remove the flywheel side crankcase — tap crankshaft with plastic mallet.

A. Suspend above work surface.
B. Tap with mallet.

**NOTE:** A nut should always be placed on a threaded shaft when pounding or pressing on it.

20.5

Remove the flywheel side crankcase seal with 1/2" (13 mm) socket.

20.6

Heat the clutch side crankcase with heat gun to 150°F (65.5°) C.

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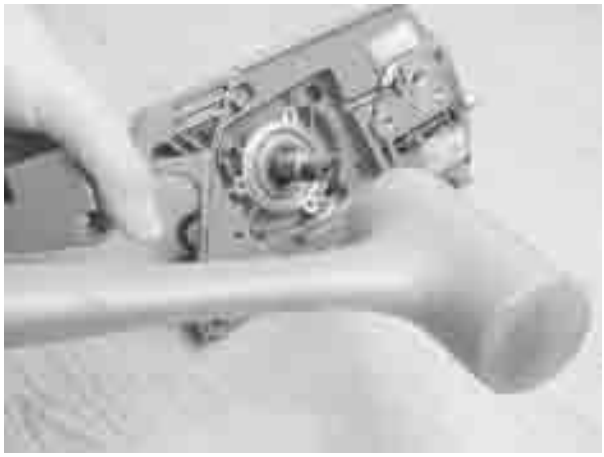
20.7

Remove crankshaft from the clutch-side crankcase tap crankshaft with a plastic mallet.

A. Suspend above work surface.

B. Tap with plastic mallet.



20.8

Remove the bearing from the flywheel side of crankshaft.

20.9

Remove the bearing, seal, and bushing from the clutch side of crankshaft.

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20.10

Clean mating crankcase faces.

20.11

Heat crankcase halves to 150° F (65.5°) C.

20.12

Install bearing into crankcase halves.

20.13

Tap with bearing driver and mallet.

20.14

Repeat with other half.

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20.15

Install crankshaft into clutch side of case.

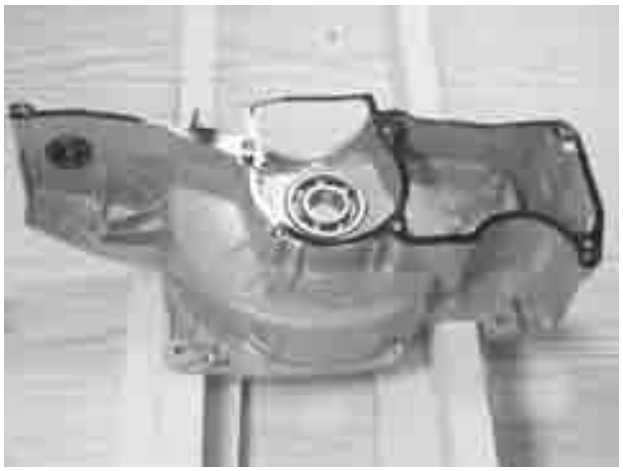
20.16

Place clutch side crankcase seal on crankshaft.

A. Tap lightly with bearing driver and mallet.

20.17

Coat crankcase gasket with ICS® 2-stroke engine oil.

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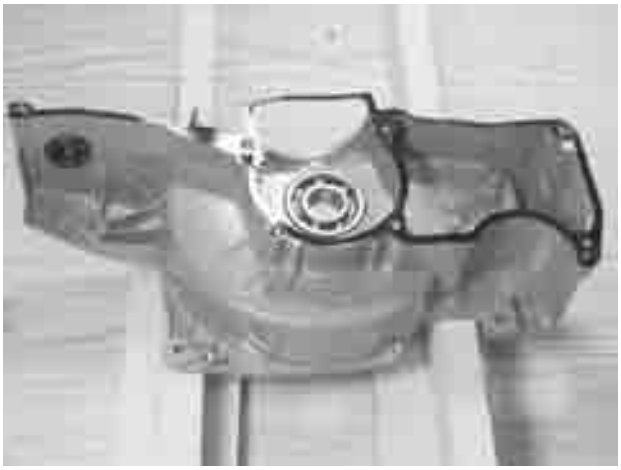
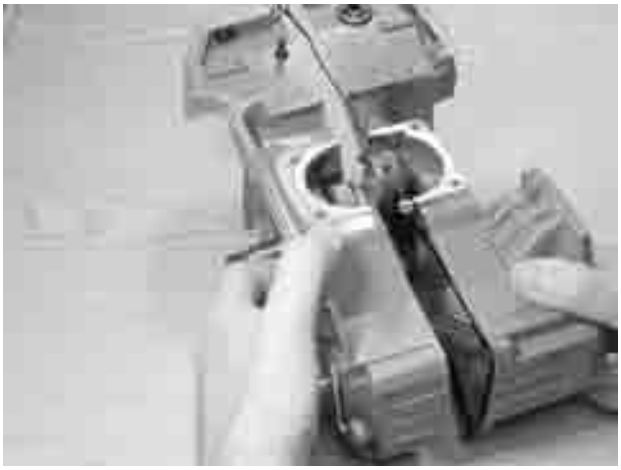
20.18

Align crankcase gasket on flywheel side crankcase pins.



20.19

Place crankcase halves together and align crankcase pins.



20.20

Assemble crankcase halves — tap with bearing driver and mallet.

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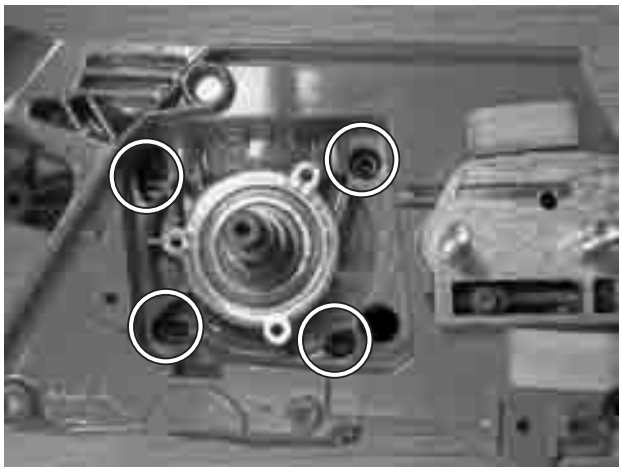
20.21

Install main crankcase bolts.

A. Use Loctite® 242.

B. Torque to 69 in-lbs. (7.8 Nm.)

NOTE: The (3) remaining crankcase bolts will be installed during the completion of the assembly.



20.22

Install flywheel side crankcase seal — tap with bearing driver and mallet.

20.23

Trim crankcase gasket flush.

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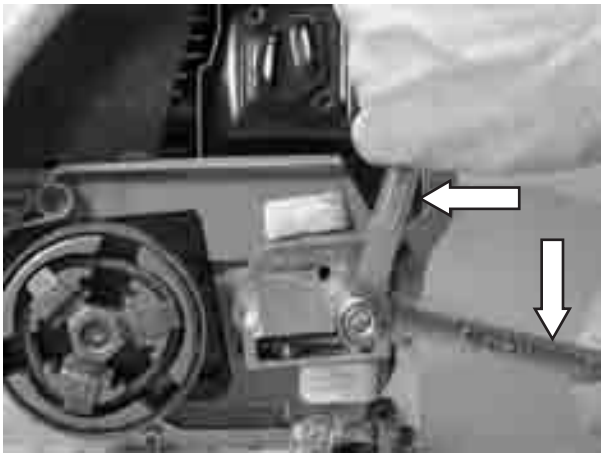
**21. This section covers the removal and installation of the bar studs and bar pad.**

21.1

Remove bar studs.

A. Remove side cover.
B. Install side cover nuts, flange to flange and tighten together.
C. Attempt to remove the inside nut which should pull out the bar stud.
D. Repeat on the second bar stud.



21.2

Remove bar pad.

A. Remove sealing o-ring.

21.3

Assemble in reverse order.

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**22. This section covers the removal and installation of the chain tensioner.**

22.1

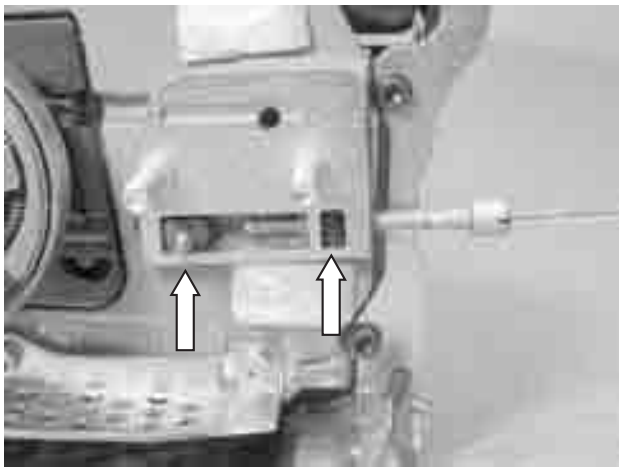
Remove bar plate to expose the chain tensioner.

22.2

Unscrew tensioner to remove.

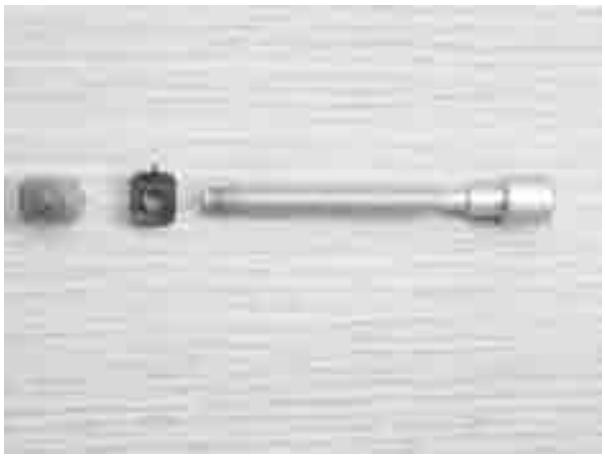
A. Remove tensioner pin.

B. Remove tensioner screw keeper.



22.3

Assemble in reverse order.

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**23. This section covers carburetor tuning. Included in this section are basic settings, idle speed adjustment, and complete adjustment.**

The carburetor has been set at the factory for optimal performance and compliance to EPA Phase II emissions standards. However, minor adjustments may be required in certain conditions, such as high elevation.

**NOTES:**

• These saws are equipped with an electronic speed limiter, as part of the ignition system. This will prevent the saw from going above 12,000 RPM. Attempting to set the carburetor mixture to increase the speed or power beyond this limit may seriously damage the engine.

• Always check the air filter, pre filter, fuel filter, and spark plug before making carburetor tunings and clean or replace if necessary.

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23.1

Basic Setting:

H = 2 1/4 - 2 3/8 turns from closed.

L = 1 1/4 to 1 3/8 turns from closed.

Complete carburetor readjustment.

23.2

Remove limiter cap.

A. Limiter caps can only be removed after the cylinder cover and screw boot have been removed. Observe orientation of the release slots on the adjustment screw limiter cap. See section 10 for cylinder cover removal.

B. Insert the limiter cap puller into the center of the limiter cap.

C. Firmly hold the tool shaft while screwing in the puller screw until the screw head is against the puller shaft.

D. Unscrew the puller screw, 1/4 turn and pull straight out. Repeat for second limiter cap.

23.3

Using a 5/64" straight blade screwdriver, gently turn the adjustment screws clockwise until completely closed.

23.4

Set the adjustment screws at the basic setting (see section 23.1).

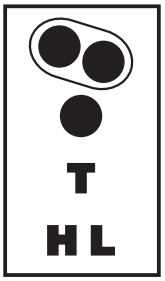
⚠ The side cover must be held tightly in place with the side cover nuts, using a bar and no chain. ***Failure to follow this procedure may result in personal injury and or damage to the saw.***

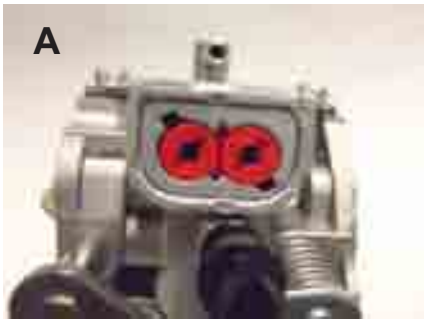
RPM settings for saws.

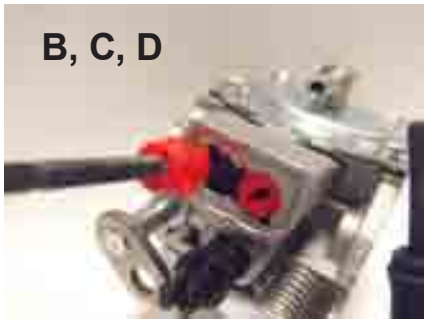
**NOTE:** Saw tuned without chain installed.

Idle Speed = 3,000 ± 200 rpm

Full Throttle = 11,500 ± 500 rpm



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23.5

Start the saw and warm up the engine.

23.6

With a tachometer check the saw rpm, with a bar and no chain.

Idle = 3,000 ± 200 rpm.

If the idle rpm does not fall into this range, adjust the T screw, clockwise to raise rpm, counterclockwise to lower rpm.

23.7

With a tachometer check the saw full throttle rpm, with no bar and chain:

Target:= 11,500 ± 500 rpm

23.8

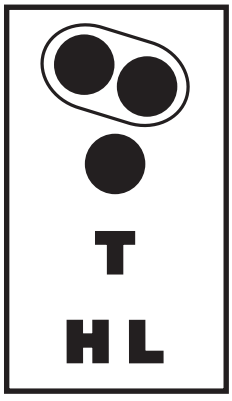
If the full throttle falls below this range, turn the H screw in (clockwise) 1/16th of a turn at a time.

A. Pulse the throttle to help stablize the system.

⚠ Do not hold the saw at max rpm for more than 5 seconds or cylinder damage could occur.

23.9

When the carburetor is adjusted correctly, set the limiter caps securely onto the needle screws with a straight blade screwdriver.

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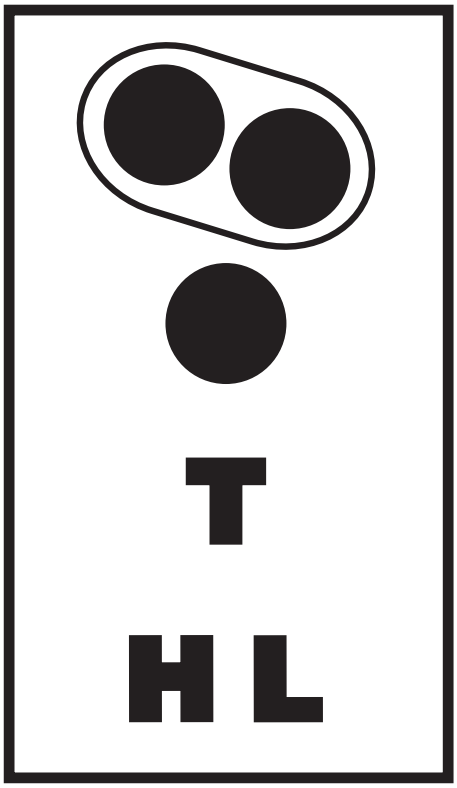
**24. This section covers idle speed adjustment.**

24.1

If engine stops while idling:

A. Make sure the chain is properly tensioned.
B. Turn T screw clockwise until chain begins to move.
C. Back T screw out 1/2 turn.




24.2

If chain turns at idle.

Back T screw out until chain stops moving.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| CHECK | | POSSIBLE CAUSE | REPAIR |
|---|---|---|---|
| The engine runs rough at all speeds | YES → | • Dirty or clogged air filter.<br>• Water has been ingested.<br>• Loose or dirty spark plug. | • Clean or replace the air filter.<br>• Inspect air intake sysetm for water.<br>• Inspect fuel system for water.<br>• Tighten, clean, or replace spark plug. |

⚠ A dirty air filter is the #1 reason for engine problems.

| | | | |
|---|---|---|---|
| The engine is overheating. | YES → | • Operator is overworking the saw.<br>• Carburetor mixture is too lean.<br>• Incorrect fuel/oil ratio.<br>• Flywheel fins are clogged.<br>• Air deflector is missing.<br>• Cylinder fins are clogged | • See Operator's Manual.<br>• See Carburetor Tuning section.<br>• See Saw Specifications section.<br>• Clean flywheel fins with wire brush.<br>• See Starter Cover section.<br>• Clean cylinder fins. |
| Poor acceleration. | YES → | • Dirty or clogged air filter.<br>• Clogged fuel filter.<br>• Incorrect carburetor tune.<br>• Plugged tank breather.<br>• Blocked pulse tube. | • Clean or replace the air filter.<br>• Replace fuel filter.<br>• See Carburetor Tuning section.<br>• Repair or replace fuel tank breather.<br>• Replace pulse tube. |
| Uneven idle or engine may "run away" | YES → | • Air leak at intake boot, cylinder gasket, or crankcase gasket.<br>• Faulty carburetor diaphragm. | • Inspect air intake boot.<br>• Pressure test crankcase.<br>• Replace carburetor. |
| Diamond chain moves at idle. | YES → | • Idle speed too high.<br>• Broken clutch spring. | • Adjust idle speed.<br>• Replace clutch spring. |
| Excessive vibration. | YES → | • Damaged shock absorber.<br>• Damaged or broken flywheel fins.<br>• Bent crankshaft. | • Replace shock absorbers<br>• Replace flywheel.<br>• Replace crankshaft. |

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## Saw Will Not Start

| CHECK | | POSSIBLE CAUSE | REPAIR |
|---|---|---|---|
| Does the engine crank? | NO | • Dirty or broken recoil starter.<br>• Internal damage. | • Clean, rebuild or replace the recoil starter.<br>• Inspect for internal damage such as seized piston. |
| Is there spark? | NO | • The ignition switch is “OFF”.<br>• Faulty ignition ground.<br>• Faulty spark plug lead.<br>• Faulty ignition coil. | • Move switch to “ON” and re-test.<br>• Tighten connections or replace ground wire.<br>• Repair or replace spark plug lead.<br>• Replace ignition coil. |
| Is the spark plug firing properly? | NO | • Plug is soaked with fuel.<br>• The plug is fouled or gapped improperly.<br>• Plug is internally faulty or the wrong type. | • Dry plug, expel excess fuel from cylinder and crankcase.<br>• Clean and re-gap the plug to 0.020 inch (0.05 mm).<br>• Replace with the correct plug – see Spark Plug Reference Guide. |
| Insure cylinder compression is above 125 psi | NO | • Loose spark plug.<br>• If below 125 psi – excess wear on the piston, cylinder, rings and/or improper fuel mixture. | • Tighten plug and re-test.<br>• Replace piston and cylinder.<br>• Ensure correct fuel/oil mixture (25:1) |
| Is the fuel fresh? | NO | • Fuel is old, varnished, or contaminated. | • Empty tank and re-fill with fresh fuel of the correct mixture (25:1) |
| Is the fuel reaching the carburetor? | NO | • Clogged fuel filter.<br>• Damaged fuel line.<br>• Damaged pulse tube.<br>• Plugged fuel tank breather. | • Replace fuel filter.<br>• Replace fuel line.<br>• Replace pulse tube.<br>• Repair or replace fuel tank breather. |
| Is too much fuel reaching the carburetor? | YES | • Carburetor is tuned incorrectly.<br>• Plugged fuel tank breather. | • Refer to Carburetor Tuning section.<br>• Repair or replace fuel tank breather. |
| Is the flywheel key sheared? | YES | • Loose flywheel. | • Replace key and reinstall flywheel. |



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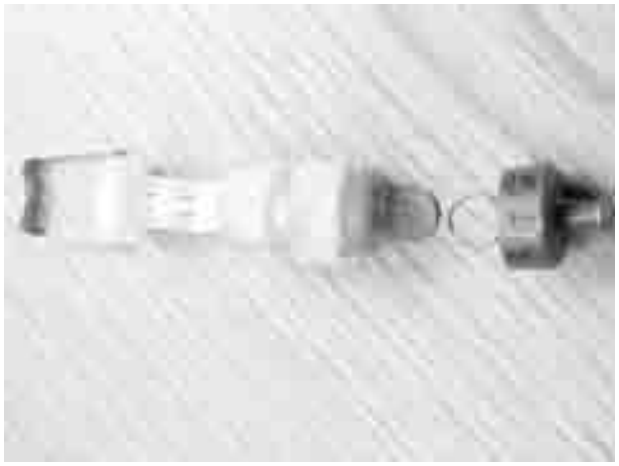
**26. This section covers testing the fuel system for leaks. Engine starvation can result from a leak or malfunction of any of the main components of the fuel system. The five main components are the fuel tank, fuel tank breather, fuel filter, delivery tubes, and carburetor.**

26.1

Remove and inspect the fuel filter.

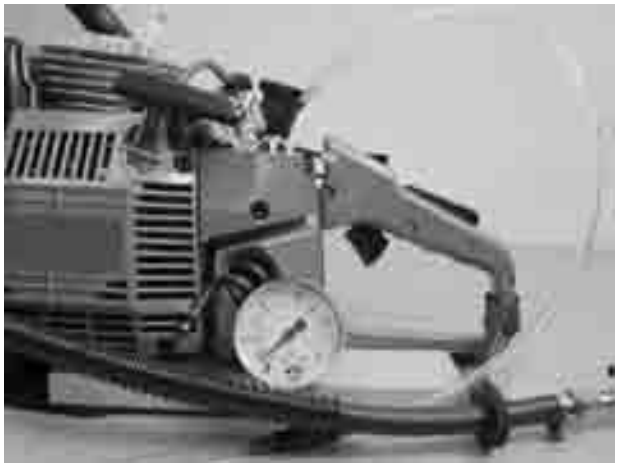
A Replace the fuel filter if there is any foreign material in the felt or the internal screen.



26.2

Test the main fuel pick-up tube for leaks.

A. Install the pressure gauge and bulb.
B. Pressurize the tube to 7psi (0.5 bar).
C. If the pressure does not maintain, separate the fuel line from the carburetor.
D. Plug one end of the main fuel pick-up tube.
E. Re-pressureize the tube to 7psi (0.5 bar).
F. Replace the tube if pressure is not maintained.
G. If the main fuel pick-up tube does maintain pressure, then the leak has been isolated to the carburetor. Refer to the Walbro Diaphragm Carburetor Service Manual.



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26.3

The fuel tank breather stabilizes the pressure in the fuel tank preventing both excessive pressure, which could flood the engine, and negative pressure, which could starve the engine of fuel.

26.4

Fuel tank breather is located inside the air filter compartment.

26.5

Testing the fuel tank breather.

A. Attached the pressure gauge and bulb to the main fuel pick-up tube at the carburetor. Pressurize the tube to 4.5 psi (0.3 bar).
B. The pressure should reduce to nearly 0 psi (0 bar) over about 3 seconds.

26.6

If the pressure does not reduce to 0 psi, disassemble or replace the breather.

A. Clean the parts with solvent or fuel.
B. Assemble in reverse order.
C. Make sure that the spring taper is oriented in the correct direction. Narrow end towards the end of the cap.

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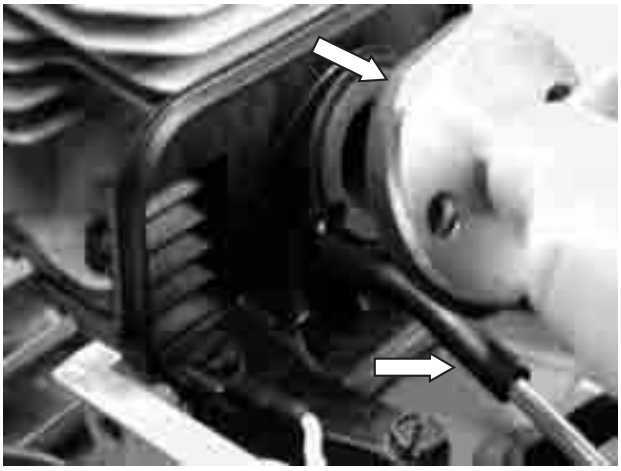
**27. This section covers testing the crankcase for leaks. A leak in the crankcase can cause the engine not to run.**

27.1

Install the intake seal flange.

A. Plug cylinder pulse tube.



27.2

Install the exhaust seal flange.

27.3

Block one of the flange tubes with a rubber plug.

27.4

Install the pressure gauge and bulb.

27.5

Pressurize the crankcase to 7psi (0.5 bar).

27.6

If the pressure does not remain the same, use soapy water to find the leak.

NOTE: It is recommended that this test be performed after an engine rebuild.

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| Spark Plug Reference Guide | | |
|---|---|---|
| ICS Part Number | Champion | NGK |
| 514770 | RCYJ4 | BPMR8Y |


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